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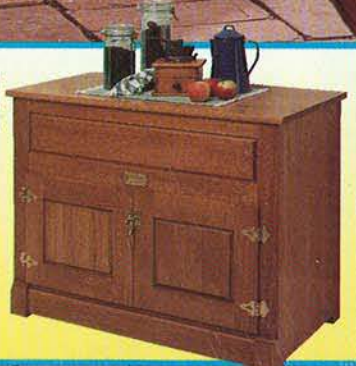

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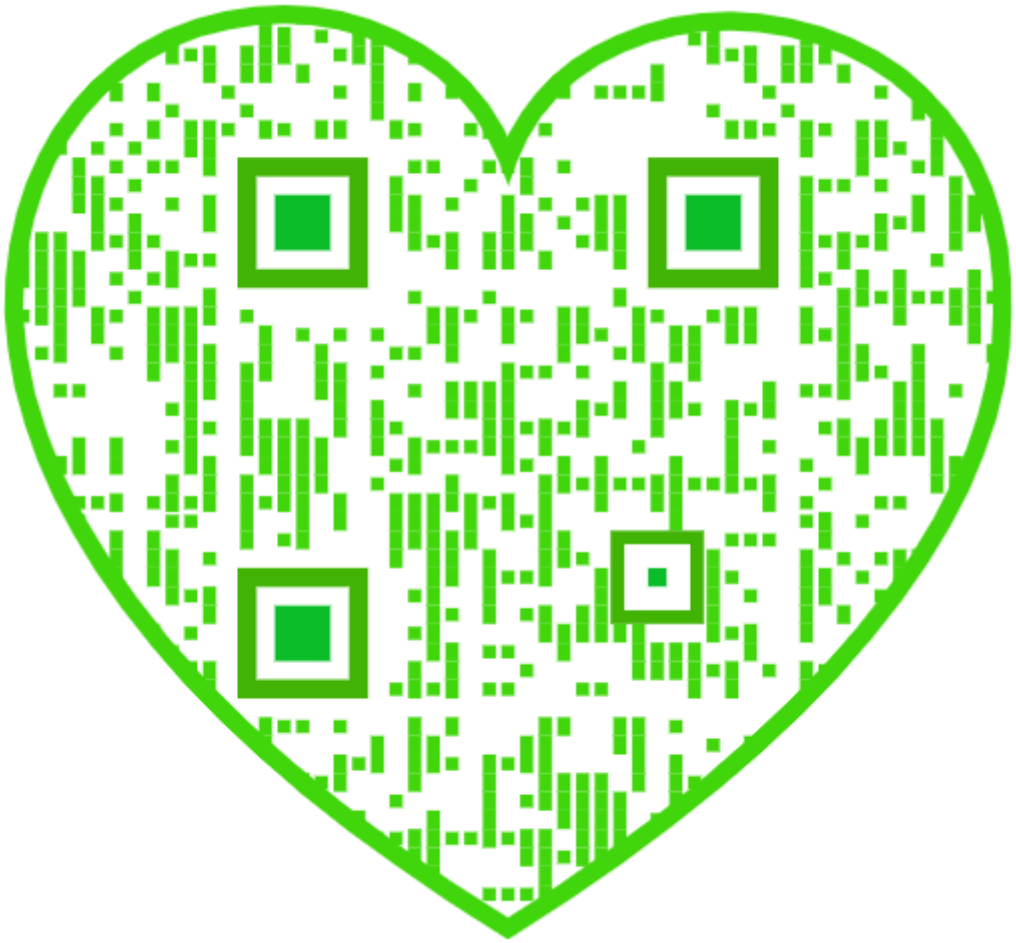

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## THE EDITOR'S ANGLE

# YOU MIGHT SAY HE'S "REALLY INTO" CHAIRS

**"Refurbishing chairs is hard work," says Greg Wood. "Sometimes you just have to sit down and admire what you've done."**

Have you ever been out just browsing around and come across something you had no intention of purchasing? And before you realize it, you've bought it? I know I have. And not long ago, so did *WOOD®* magazine reader Greg Wood.

Greg, who is in the process of starting a furniture-making business, told me, "I just took off one morning in the pickup, hoping to find four or five pressed-back chairs to go along with a dining table I had just built for the family. But before the day was over, I got a little carried away."

It turns out that when Greg pulled into a small southern-Iowa town and started looking around, he happened onto a 75-year-old man who owned about 400 old chairs! After talking with Greg for a few minutes, the man and his wife offered to sell Greg their entire inventory—lock, stock, and barrelsful of miscellaneous parts.

So what did Greg get for his $1,200? "Most of the chairs need a fair amount of work," reports this adventurous woodworker. "But I like refinishing things. And I've turned up a Stickley chair and a folding rocking chair that are pretty neat."

And how did he break this interesting news to his wife, Danita? Greg, who just turned 40 years old, told her, "Honey, some guys buy a Ferrari as part of their midlife crises; I bought 400 chairs." And can you believe it; she liked the idea!

So far, Greg has refinished about 100 chairs and has sold 20 of them. Good luck, my friend. May your business grow and prosper.

Larry Clayton

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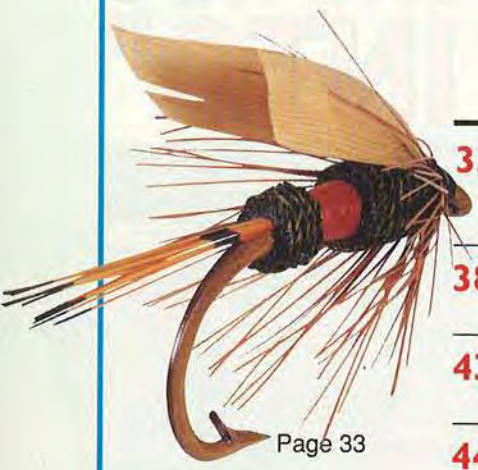
THE WORLD'S LEADING WOODWORKING MAGAZINE



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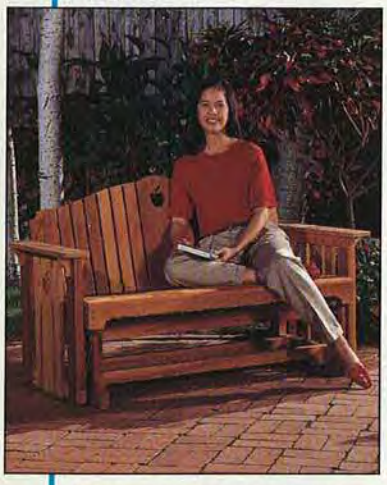

*This issue's cover wood grain: Bald Cypress*

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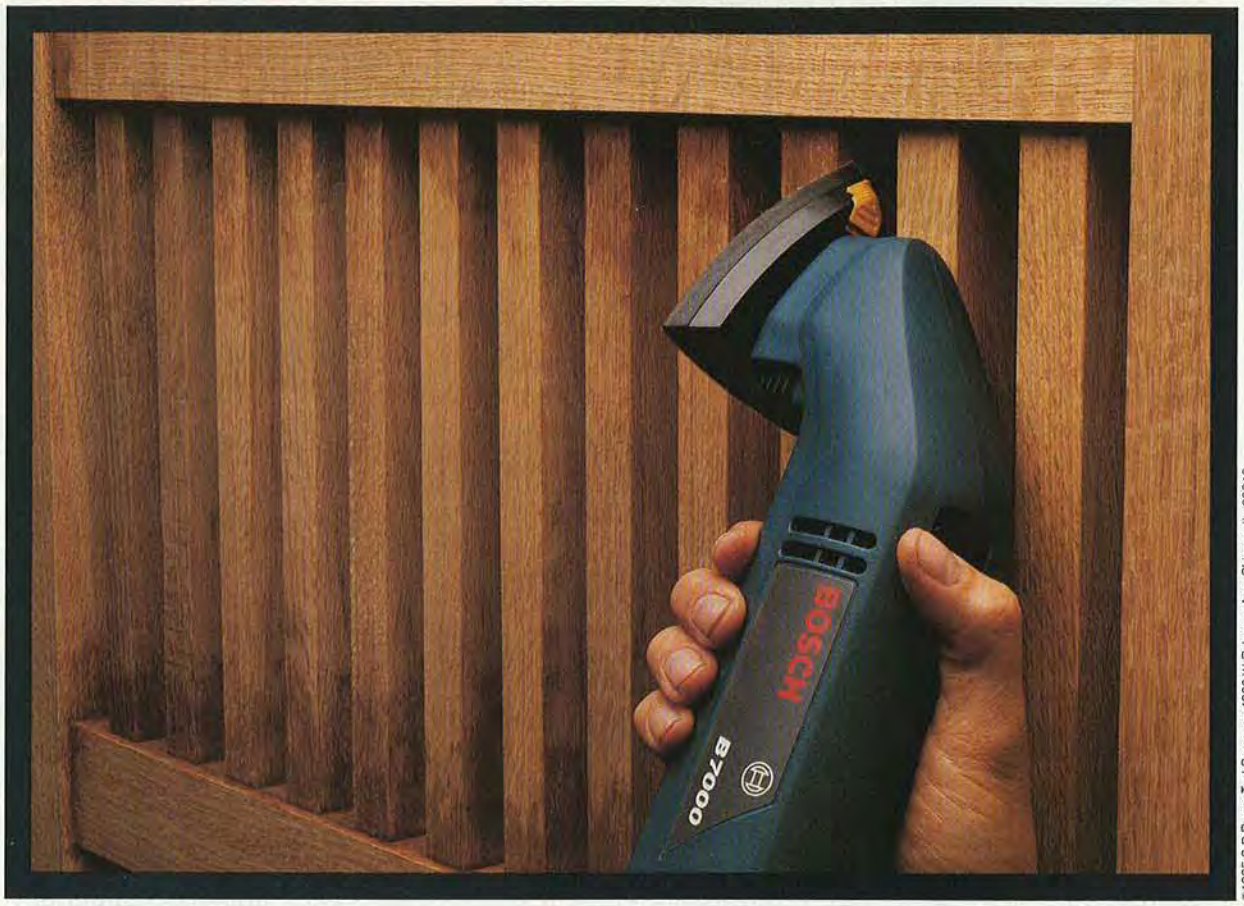


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*What woodworkers need to know*

# DRILLING AND BORING TOOLS

**Need to make a hole in wood? You'll find a wide array of bits suitable for drilling and boring in wood. Here's a look at some of the popular choices.**

•**Standard twist drill.** This bit, the type shown at far left in Photo 1 *below*, is the first one you're likely to think of for drilling holes up to ½" in diameter in wood, metal, or plastic. Inexpensive and readily available, twist drills come in a vast array of sizes. The most common bit sizes are the fractions of an inch from 1/16" to ½" in 1/64" increments. (You can buy inch-sized twist drills in diameters from 1/64" to 1½".)

But, twist drills also come in wire-gauge sizes numbered from 1 through 80—all less than ¼" diameter. (Larger numbers are smaller drills.) Need more sizes? Try letter bits from A to Z. These range from just under 15/64" to a little over 13/32" in diameter, with drill size increasing as you go up the alphabet. If those aren't enough, you'll find bits in metric sizes, too.

You could gather scores of twist drills without any two being the same size. But for most woodworking chores, a set that ranges from 1/16" to ¼" by 64ths plus the four bits from 5/16" to ½" by 16ths will suffice. You can buy the larger bits with reduced-size shanks.

Twist drills work best at higher speeds. In hardwood, you can run bits up to 3/16" in diameter as fast as 3,000 rpm. Cut the speed to 1,500 rpm for bits up to 3/8", and slow down to 750 rpm up to ½".

•**Improved twist drill.** Starting a hole with a standard twist drill can be irksome, particularly with a hand-held drill. (For best results, center-punch marks for drilling, even when using a drill press.) So often, after positioning the bit where you want the hole, you pull the trigger and the bit wanders off across the wood, missing the mark completely and marring the surface, too.

Tool manufacturers have brought out new bits that reduce this tendency. Split points, pilot points, and different point angles are some of the tactics used to make premium drills such as the gold and silver ones shown in Photo 1 easier to start.

In addition to the modified tip, many of the new premium bits feature changes to the flute and body aimed at reducing friction and wear while increasing cutting ease. Such bits require less power to drill a hole, so you can drill more holes per charge with your cordless drill. The pilot-point type exits more cleanly than other twist drills, too.

•**Titanium-coated bit.** Some bits feature titanium-nitride or -nitrate coating. The hard, slick finish helps them cut better and last longer, the manufacturers say. *WOOD*® magazine testing found that the titanium coating offers few advantages for drilling wood. If you drill metal frequently, though, the gold-colored bits represent a good buy.

•**Brad-point bit.** Many woodworkers turn to brad-point bits for precise drilling, particularly for dowel holes. This bit looks much like a twist drill, except at the tip. There, it's ground nearly flat, but with an extended point in the center—the brad point—and a pair of cutting spurs, as on the bit shown in Photo 2.

The bit's extended point makes lining up on a mark easy. The spurs minimize splintering, making a cleaner cut. And the bottom of a hole drilled with a brad-point bit is nearly flat. Run brad-point bits at about 1,200 rpm for 1/8", 1,000 rpm for sizes up to ¼", and 750 rpm to ½".

Allowing chips to pack into the flutes on any twist-type drill can overheat the bit and burn the wood. To avoid problems, back the bit out of the hole often to clear the chips.

•**Spade bit.** The flat blade shown in Photo 3 distinguishes this bit from other drills. Spade bits cost little and work well for general drilling in hard or soft woods. They're a good way to go when drilling holes beyond normal twist-drill size, from ½" up to 1½" in diameter. You can buy spade bits as small as ¼".

These bits bore relatively quickly. Don't rely on them for your finest cabinetwork, however. Spade bits don't make particularly clean holes—they seem to scrape and tear the wood more than they cut and slice it.

*Continued on page 6*

# TR215 - Sliding Compound Miter Saw

The Freud Sliding Compound Miter Saw - It's new. It's fast and it's very precise. It's versatile like a radial arm saw and easy to adjust. Best of all, it comes complete with a Freud saw blade, specially designed for our new miter saw. And the price? Very reasonable.

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What woodworkers need to know

# DRILLING AND BORING TOOLS

*Continued from page 4*

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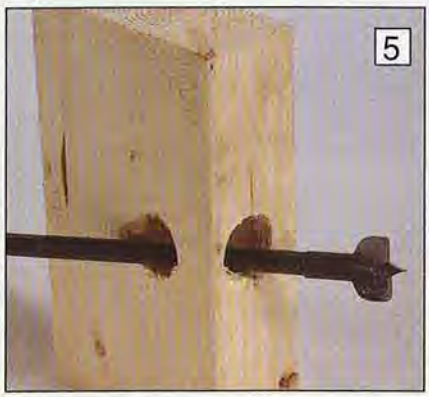
Variations on the standard spade bit, such as Irwin's Speedbor 2000 and the Vermont American Wood Eater, *left*, offer refinements for faster, cleaner boring. The Wood Eater has a self-feeding screw point. Another style from Vermont American called Around the Corner, Photo 5 *below*, lets you drill, as the name implies, a curved hole—handy for electrical wiring in home remodeling, among other things.



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Spade bits and their brethren call for lower speeds. In hardwood, limit the speed to 1,500 rpm for spade bits up to 1", 1,000 rpm for larger ones. Speedbor 2000 bits can go to 1,800 rpm for all sizes. Recommended speed for ½" and ⅝" Wood Eater bits is 700 rpm; larger sizes, 600 rpm. Go slow in curves, too: operate the Around the Corner bit in the 600–850 rpm range.

•**Powerbore bit.** Stanley's Powerbore, Photo 6, drills a cleaner hole than the spade bit. Available in diameters from ⅜" to 1" in ⅛" increments, these bits handle end-grain drilling particularly well. The long, brad-type point guides the bit, and makes it easy to center on a mark. The bit cuts relatively quickly, but doesn't carry chips out of the hole. So, if you're drilling a deep hole, withdraw the bit frequently to clear the chips. Speeds in the vicinity of 500–750 rpm will work fine.

6

•**Auger bit.** Before power drilling, there was the brace and auger bit. Many tool dealers still sell augers with the traditional tapered square shank end for use with a brace. You can also buy a straight-shank version to fit the chuck on your power drill.

Augers, like the one shown in Photo 7, bore smooth holes. They're well-suited to deep-hole boring because of their length: A ¼" auger is nearly twice as long as a ¼" twist drill. And you can buy even-longer ship augers and pole augers. While some augers are sized in inch fractions, you'll still find many identified by the traditional number system. Don't let it throw you, though. The number simply refers to the bit diameter in 16ths of an inch. So, a bit marked 10 would be 10/16", or ⅝".

Most augers self-feed with a screw tip. When power-drilling with an auger, don't run the bit at more than 600–700 rpm.

•**Forstner bit.** A true Forstner bit, named after its inventor, has only a small center point, shown on the left in Photo 8. The outer rim guides the bit instead of the center point, enabling the Forstner to cut holes with nearly flat bottoms and smooth, true sides. That also means you can cut any arc of a hole on a workpiece—the center doesn't have to be on the stock. The small point makes the bit difficult to center on a mark, however.

These are expensive bits, but to many woodworkers, they're the ultimate drilling or boring tool. Sizes generally run from ¼"–2". For maximum accuracy, you'll want to use the Forstner bit in a drill press. Clear the chips often, and run the bit at a moderate speed to prevent heat damage to the cutting edge. Try 700 rpm for bits less than ½" diameter, 500 rpm for bits up to 1", and 250 for those larger than 1". Carbide-tipped Forstner bits are available.

7

8

•**Multi-spur bit.** Though this one is often called a Forstner bit, it isn't. The teeth around the multi-spur bit's rim (shown at the right in Photo 8) are the difference between it and the Forstner type.

These bits are expensive, but cut cleanly and without splintering. Multi-spur bits work well when drilling into a workpiece on an angle. They do a great job with overlapping holes, too.

Sizes range up to more than 4". You should consider any large one a drill-press-only bit. Even the smaller sizes are much easier to keep under control with the drill press. In hardwood, you can run bits 1" or smaller at about 500 rpm. Slow down to 250 rpm for bits from 1" to 4".

•**Holesaw and circle cutter.** Instead of taking out the inside of a hole as chips, you can remove it in one chunk with a holesaw or circle cutter, both shown *below*. They're the tools to turn to when you need a really large hole.

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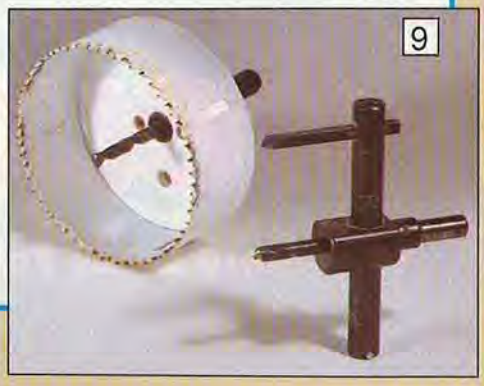

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What woodworkers need to know

# DRILLING AND BORING TOOLS

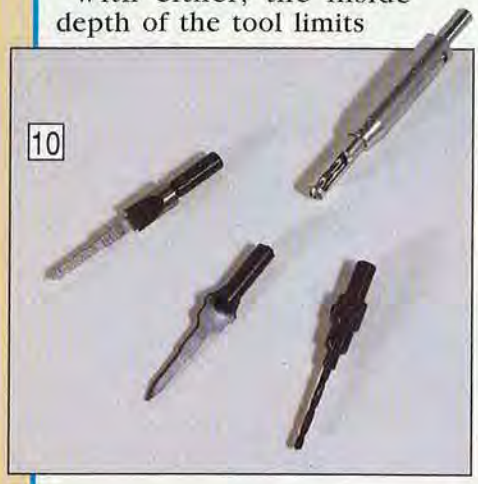
*Continued from page 6*

You'll find holesaws up to 6" in diameter and circle cutters that adjust to 8" or more.

Holesaws use fixed-size cutters. The cup-shaped blade fits onto a mandrel equipped with a twist drill in the center. The drill bit acts as a pilot for the tool.

The circle cutter (sometimes called a fly cutter) adjusts to any diameter within its range. It also employs a twist drill for a pilot, but cuts with a single blade.

With either, the inside depth of the tool limits the cutting depth. To go through thick stock, you can drill as far as the tool will go, flop the workpiece, then drill from the back, using the pilot hole as a guide. With a holesaw, you can withdraw the tool when it bottoms out, break the core out of the stock, then saw farther.


10

Clamp the workpiece firmly when using either one. Holesaws, especially those 1" or less, work well with a portable drill (but hang on tight). Larger holesaws and any size circle cutter should be used only in the drill press. Limit the speed for either tool to 250 rpm.

•**Specialty bits.** If you use a lot of screws in your projects, check out *screw pilot bits*. These inexpensive bits drill the pilot and shank holes for a screw and form a countersink for the head, all in one operation. Other bits of this type counterbore for a plug. The three bits at the lower left side of Photo 10 are typical.

For attaching hinges and other hardware, a *Vix bit*, shown at the upper right of the photo, comes in handy. A sleeve on this bit fits into the countersunk screw hole on the hardware item, automatically centering the bit, which then extends from the sleeve to drill the screw pilot hole.

11

An *expansive bit* like the one shown in Photo 11 bores holes of many sizes. A sliding cutter sets the diameter—useful if you need to bore odd-sized holes. The two available sizes cover a range of hole diameters from ⅝" to 5". Interchangeable cutters give the bit shown a range of hole diameters from ⅝" to 3". Power-drilling with one can be problematic, though. You'd be better off using one only with your brace.

## General tips for drilling

•Back the workpiece with scrapwood to minimize splintering when the bit breaks through. This doesn't always guarantee a splinter-free hole when you're using twist drills, however.

•Feed the bit steadily into the work. Don't force the bit, trying to make it cut faster than it's able to. On the other hand, don't feed it with such light pressure that the bit rubs without cutting. Either situation can overheat the bit, dulling it and possibly burning your project part.

•Always secure the workpiece solidly. When possible, use a drill press, and clamp the piece being drilled to the table. When using a portable drill, clamp the workpiece, and use both hands to hold the drill. Be sure to use an auxiliary side handle when using a large bit in a portable drill.

•Before you start the drill, chuck the bit tightly. Give the chuck key a twist in each of the three holes around the chuck body.

•Wear eye protection whenever you're drilling.

•Clear chips from the hole as you drill. If you're drilling metal, don't sweep the chips away with your hand—they can be razor sharp. Instead, blow them away or use a brush.

•Remember that the bit will be hot, possibly very hot, after drilling. Don't grab hold of it as soon as you pull it from the hole.

•Use only sharp bits. You can sharpen twist drills yourself—although the smaller ones can be difficult to sharpen well. Spade bits sharpen easily.

•When you have a choice, buy bits made of high-speed steel (HSS). They'll hold an edge longer, even if you run them hot. Carbide-tipped tools last a long time, too. (But don't think that carbide-tipped twist drills for masonry drilling will help you in woodworking. They won't.)

To receive a comprehensive drill-press speed chart for use in your shop, send $1 for postage and handling to *WOOD*® magazine Speed Chart, 1912 Grand Ave., Des Moines, IA 50309-3379.

Photographs: John Hetherington  Written by Larry Johnston

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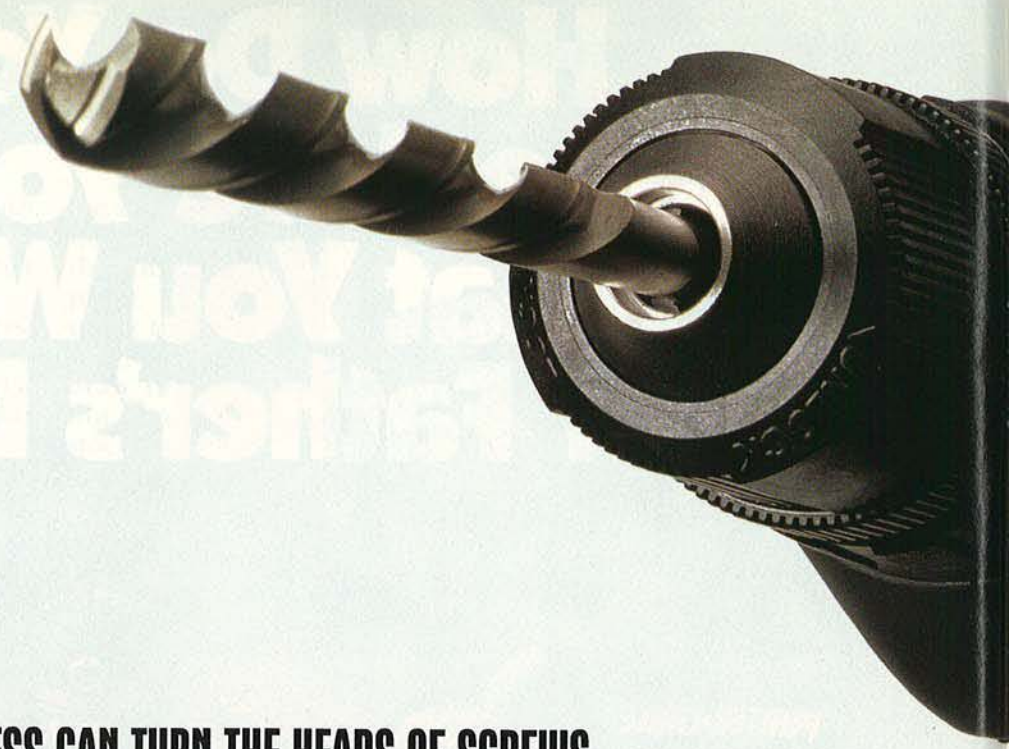

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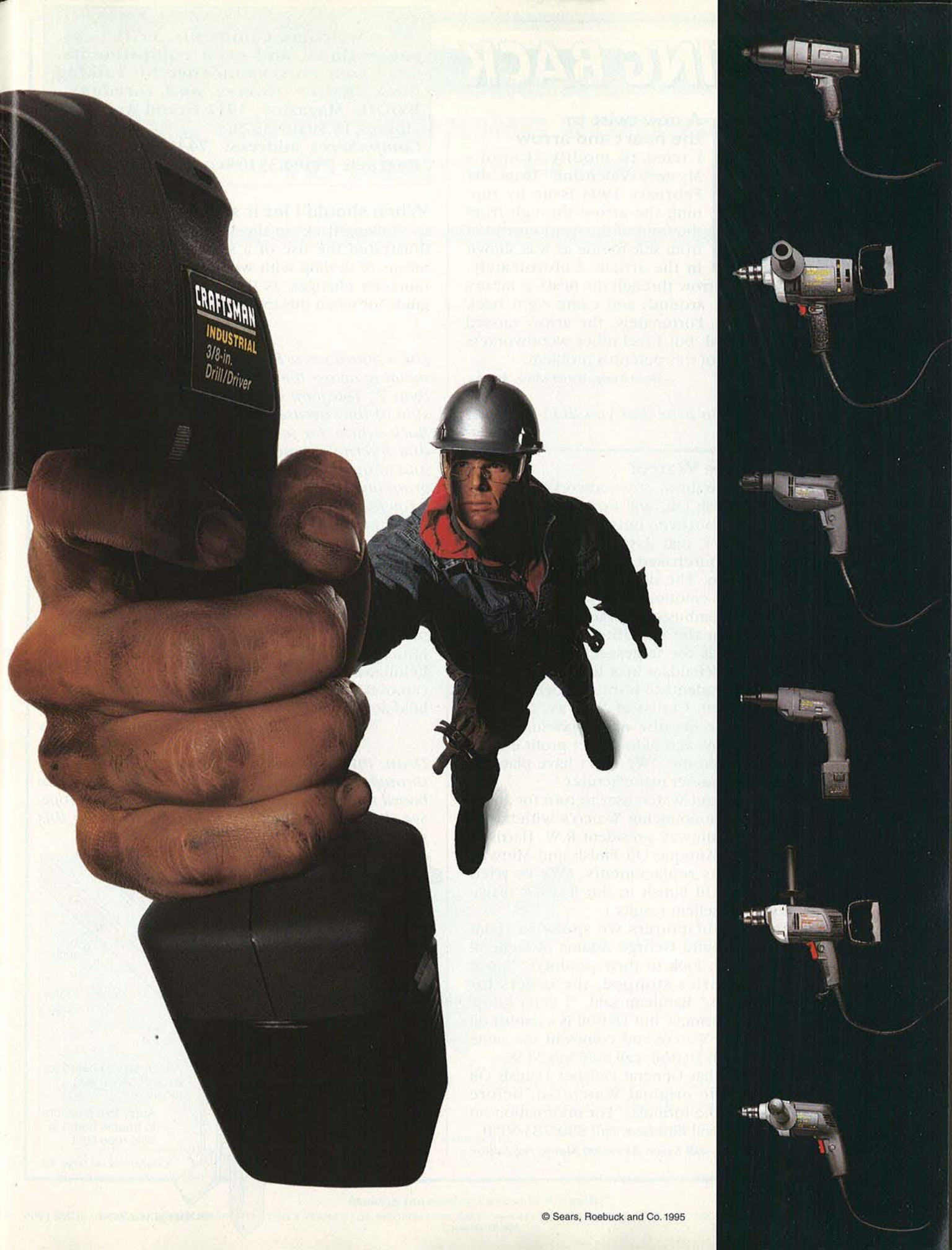


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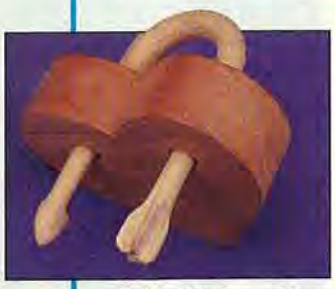
# TALKING BACK



## A new twist to the heart and arrow

I tried to modify "Cupid's Mystery Valentine" from the February 1994 issue by running the arrow through from the front of the heart instead of from side-to-side as was shown in the article. Unfortunately, while driving the arrow through the heart, it hit my bench, turned around, and came right back through the front. Fortunately, the arrow missed me on the rebound, but I feel other woodworkers should be warned of this potential problem.

*—Steve Emig, Ward Cove, Alaska*

*Steve, we're glad to hear that you didn't suffer a broken heart.*

## What? No more Watco?

A long-time favorite finish of woodworkers far and wide, Watco Danish Oil, will no longer be available. The manufacturer halted deliveries on December 1, 1994, just days after a New York investment firm purchased Minwax, the parent company of Watco. The decision also came only nine days after an emotional television report on the spontaneous-combustion hazards of linseed-oil-based finishes. In the Dateline NBC program, Watco was cited as the largest-selling linseed-oil finish, and as the defendant in at least five pending lawsuits alleging inadequate warning labels.

According to Brian Curtiss of Minwax, the decision was not made because of the lawsuits "The business didn't grow and didn't meet profit expectations," Curtiss told me. "We don't have plans to sell the brand to another manufacturer."

So where's a faithful Watco user to turn for an oil finish? In a letter announcing Watco's withdrawal from the market, Minwax president R.W. Harrison suggests Minwax Antique Oil Finish and Minwax Tung Oil Finish as replacements. (We've tried Minwax Antique Oil Finish in the *WOOD*® magazine shop with excellent results.)

Two other manufacturers we spoke to, Tom Barnham of Deft, and George Adams of General Finishes, hope you look to their products. "Since the Watco deliveries stopped, the orders for Deftoil are way up," Barnham said. "I don't know the exact Watco formula, but Deftoil is a danish oil that performs like Watco, and comes in the same colors. For more on Deftoil, call 800/544-3338.

Adams told me that General Finishes Danish Oil "performs like the original Watco Oil, before Minwax changed the formula." For information on where to buy General Finishes, call 800/783-6050.

*—Bill Krier, Assistant Managing Editor*

**We welcome comments, criticisms, suggestions, and even compliments. Send your correspondence to: Talking Back, *Better Homes and Gardens*® *WOOD*® Magazine, 1912 Grand Ave., Des Moines, IA 50309-3379.**
***CompuServe* address: 74404,3516 (or) Internet: 74404.3516@compuserve.com**

## When should I let it slide?

In "Talking Back" in the February 1994 issue, you illustrated the use of a slotted screw hole as a means of dealing with wood expansion caused by humidity changes. Is there a rule of thumb or a guide for when this expansion slot is required?

*—Richard Gartee, Danville, Ky.*

*Use a slotted screw hole when you fasten a piece of molding across the grain of a board that's wider than 7". This joint works for moldings on the outside of the carcase, as described in the Talking Back article, for fastening wood-drawer supports and internal frames to solid-wood carcase sides, and many other situations involving a long cross-grain overlay.*

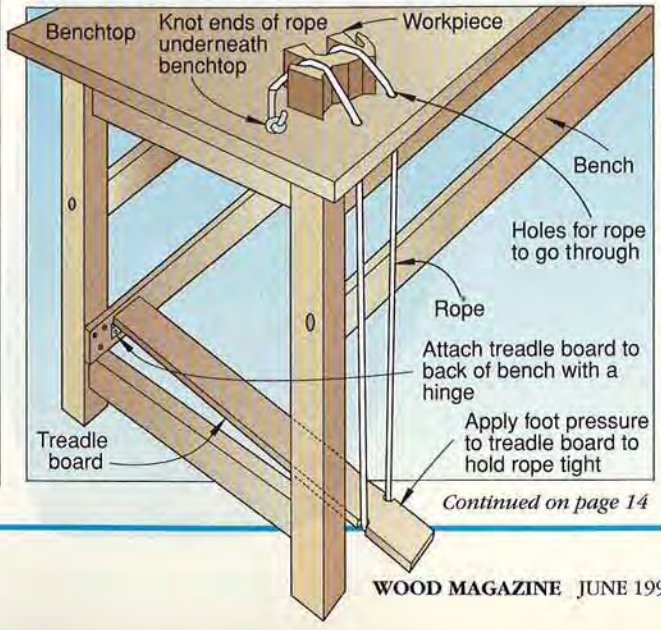
*For fastening moldings across the grain of narrower panels, glue the mitered end of the molding and fasten the other end with a finishing nail or brad. There will be enough flex in the nail to compensate for wood movement.*

## Rope that carving, pardner

In the article "Merry-Go-Round Menagerie" in the January 1994 issue, you have a photo of Jerry Reinhardt using two ropes to hold down a small carousel horse while carving it. How does this rope hold-down work?

*—Dean Schlick, Charles City, Iowa*

*Dean, this hold-down consists of a rope passed through holes in a workbench top, and a treadle board under the bench to apply tension to the rope. See the drawing* (below) *for more detail on this simple, effective device.*


Benchtop
Knot ends of rope underneath benchtop
Workpiece
Bench
Holes for rope to go through
Rope
Attach treadle board to back of bench with a hinge
Apply foot pressure to treadle board to hold rope tight
Treadle board

*Continued on page 14*

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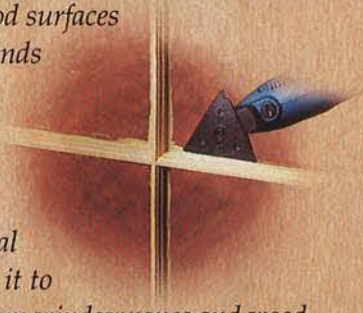

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# TALKING BACK

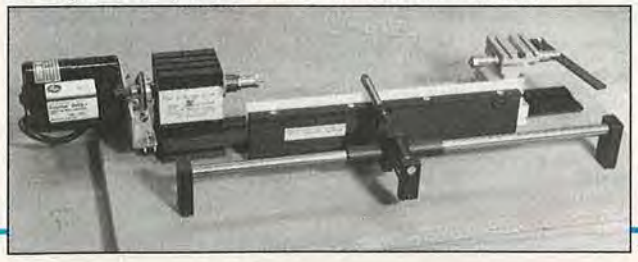
*Continued from page 12*

## Miniature-lathe pattern duplicator

"The Lure of Wood" article in the October 1994 issue showed a picture of Ron Mirabile working on a miniature lathe with a duplicating attachment. Can you help me locate such an attachment I can use for turning wooden pens, perfume applicators, and bottle stoppers?

***Richard M. Tong, The Woodlands, Texas***

*We contacted Bonnie Klein of Klein Design, Inc. about your request, Richard. Her company makes a duplicator that you can use with the small-scale Anker Lathe made by her company. Klein Design also offers a duplicator that works with the Dremel lathe. You can modify it for use with other miniature lathes. For more information, you can write Bonnie at: Klein Design, Inc., 17910 SE 110th Street, Renton, WA 98059. Call 206/226-5937.*



## Another workshop fire-prevention strategy

In addition to those steps listed in "Simple Strategies to Save Your Shop From Fire" in the February 1994 issue, I found another way to prevent a shop fire (by necessity) when a fire started in the open-frame motor on my 6" jointer/planer. I used a dry-chemical fire extinguisher to put it out. This fire was caused by sanding dust that had accumulated inside the motor. Now I regularly use compressed air to blow out accumulated dust from the motors in my shop.

***—Frank Flores, Ida Grove, Iowa***

*Frank, using compressed air to blow the dust out of an open-frame motor has both good and bad points. While the cleaned motor runs cooler and more efficiently, the compressed air may force dust into the internal starting switch. This dust build-up may not allow the switch contacts to come together, preventing the motor from starting. Then, to get the motor back in operation, you'll need to dismantle and clean the internal switch contacts. That's why we recommend you use totally enclosed motors on all machines operated around sawdust.*

*Continued on page 17*

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# TALKING BACK

*Continued from page 14*

## Ryobi cures a belt problem

For about eight months, I have used a Ryobi OSS 450 oscillating spindle sander like the one you reviewed in the September 1994 issue. One day it stopped oscillating, although the drum was still turning. I called the service center, and was informed the problem was most likely the oscillating belt. This repair was covered under warranty, but as the belt drive has to be dismantled to replace the belt, this repair is best done at a service center. I feel prospective buyers should take this into consideration before purchasing this machine.

***Joe G. Abernathy, Allen, Texas***

*Joe, for an answer to your concerns, we contacted Frank Coots at Ryobi Tools and received the following response:*

*"Belt systems on the Ryobi BT3000 tablesaw and the OSS450 sander are designed for a normal-use life-cycle of at least five years.*

*The compact design of the tools requires the belt system be located within the tool housing. Because of the relatively inaccessible belt location, Ryobi recommends that belts be serviced by one of our more than 200 authorized factory service centers. Service will normally be completed within 1-3 days. In special cases, belt replacement can be accomplished while the customer waits. Call 800/525-2579 for the location of a nearby center.*

*Belt replacement is covered free of charge under Ryobi's two-year warranty. For tools older than two years, drive belt repairs are given a 90-day limited warranty.*

*Users can purchase belts and install the parts themselves. Ryobi technical services (800/525-2579) will walk users through the installation. However, tool warranties are voided when repairs are not performed by an authorized service center.*

*Less than 1% of all BT3000 units sold within the past two years have required belt replacement. However, belt replacements for the OSS450 have been running at a higher-than-normal rate. The problem has recently been traced to a pulley that causes the belt to fail when the unit is used and stored in areas of high humidity. The part has been redesigned and is now available at authorized service centers. Users experiencing belt problems should take the unit to a service center for belt and pulley replacement. The repairs will be made under warranty. We apologize for any inconvenience to our customers."*

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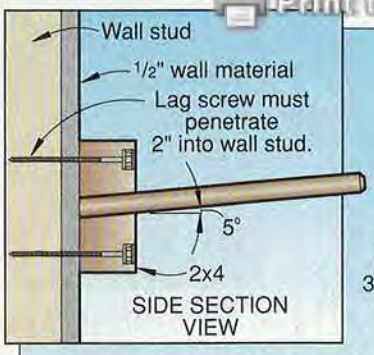
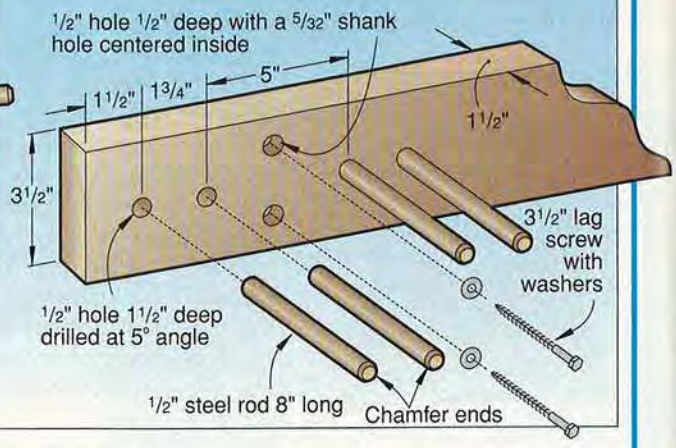



**PIPE-CLAMP RACK**


1/2" hole 1/2" deep with a 5/32" shank hole centered inside
5"
1 1/2"
1 3/4"
1 1/2"
3 1/2"
3 1/2" lag screw with washers
1/2" hole 1 1/2" deep drilled at 5° angle
1/2" steel rod 8" long
Chamfer ends

Project Design: Jim Downing
Photograph: John Hetherington
Illustrations: Roxanne LeMoine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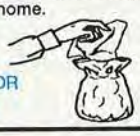

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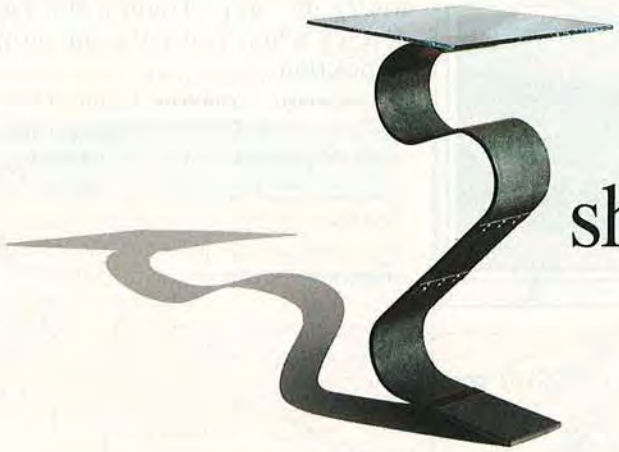

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# TIPS FROM YOUR SHOP (AND OURS)

Need a helping hand? That's the driving force behind many prize-winning shop-tip solutions.

Working in a cabinet shop or construction site, I was never far from an extra set of hands. But as a home woodworker, I'm usually on my own. That's why I appreciate shop tips such as Curran Johnson's prize-winning tip *right* that help free up an extra hand or two.

Most woodworkers have rigged dozens of fixtures like this. As shop tips, these humble helpers could be worth money. So I encourage you to look around your shop and send us a photo or a sketch of anything you've built that you think other home woodworkers would enjoy using.

If we choose to publish your tip, we'll pay you $40 and you'll earn a chance to win the top shop tip prize. Send your ideas along with a photo or drawing to:

**Tips From Your Shop**
**(And Ours)**
**WOOD Magazine**
**1912 Grand Ave.**
**Des Moines, IA 50309-3379**

We try to publish only original ideas so please send your tip to only one magazine. Also note that we cannot return submissions. Thanks and keep sending those tips.

Tom Jackson

General-Interest Editor

## Sliding stop slips down out of the way

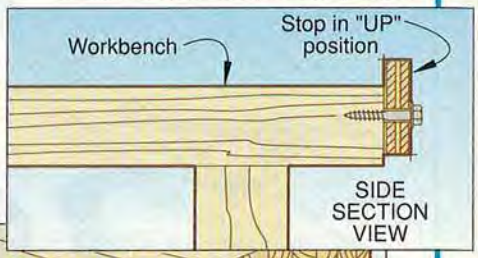
*Sometimes you need a solid edge to butt your workpiece against. But clamping a temporary stop to your bench usually proves awkward and time-consuming.*

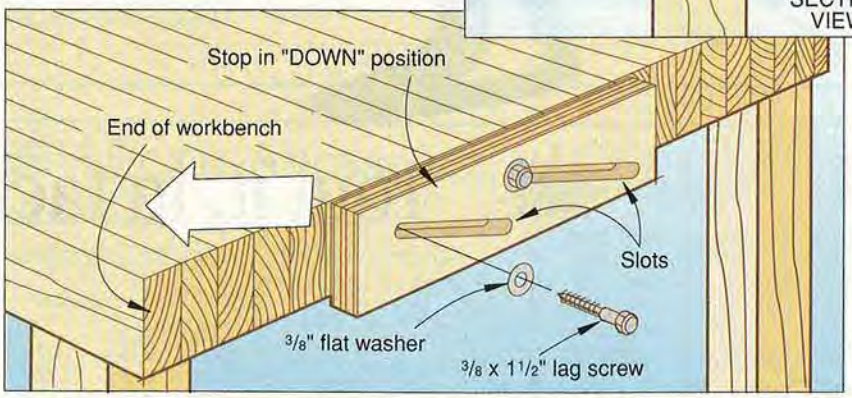
TOP SHOP TIP

**TIP:** Mount a stop that slides up and down on the end of your bench. Make the stop from a piece of ¾×2×10" plywood, and cut the slots at a 10° angle. Then, install two lag screws to guide the board on the angled slots. Loosen the lag screws whenever you need to raise or lower the stop. Tighten the lag screws when you have the stop in position.

*—Curran A. Johnson, Canton, Conn.*

**For his shop-tip prize, Curran will receive a Sears model 22590 Oscillating Spindle Sander.**



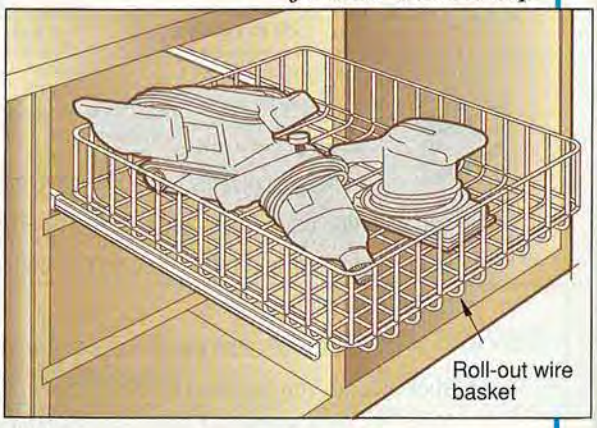




## Coated-wire baskets work great in the shop too

*Digging around for a tool lost in the deep dark recesses of a shelf or bench enclosure sometimes causes accidents when you run across a sharp bit or blade.*

**TIP:** Head for the cabinet hardware section of the local homecenter and pick up a few of those coated-wire baskets. These storage drawers ride on glides that enable you to pull them out to where you can see everything in the drawer. Another plus: the wire allows sawdust to fall through so you don't have to vacuum it out of the crevices and corners.

*—from the* **WOOD®** *shop*




*Continued on page 22*

Print this article

# TAKE A CLOSER LOOK

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You'll enjoy taking a closer look at your finished project when it's been sanded by a PERFORMAX 16-32. This space-saving benchtop drum sander will surface, dimension and finish sand to a flawless finish. Easy-to-wrap, non-adhesive abrasive strips range from 36 to 220 grit. Sand stock as wide as 32" in two passes, as short as 2 1/4", and as thick as 3". Scroll saw cut-outs can be sanded in seconds.

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**DREMEL®**

## TIPS FROM YOUR SHOP (AND OURS)

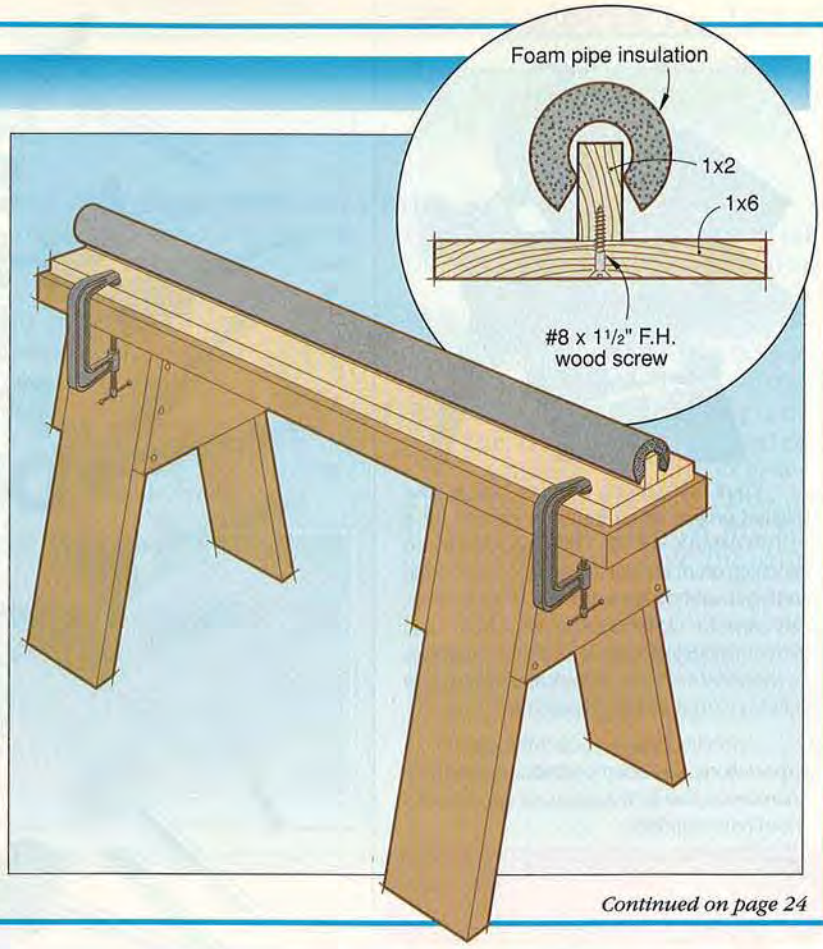
*Continued from page 20*

### Pipe insulation protects work from dings and dents

*Sawhorses get plenty of abuse in the shop, so they're not a good surface on which to lay a delicate workpiece. You've tried attaching carpet scraps, but once you staple this material to the sawhorse, you're stuck with a work support that you can't saw on for fear of snagging the blade on the carpet.*

**TIP:** Make a pair of sawhorse pads that you can quickly install or remove as the project requires. Cut two 1×6s and two 1×2s as long as the top of your sawhorse, and glue and screw them together as shown. Next, cut two pieces of foam pipe insulation to the same length and slit them down the middle. Install the foam pipe insulation over the tops of the 1×2s. Now, whenever you need to protect a workpiece, just clamp these two pads to your sawhorses, and lay the workpiece on top of them.

***—Steve Whitehouse, Randolph, Mass.***




*Continued on page 24*


# Give Yourself Some Breathing Room.

Recent medical studies show that breathing wood dust can be hazardous to your health. The JDS AIR-TECH 2000 will dramatically improve the quality of the air in your workshop.

A powerful 500 CFM motor delivers 350 CFM of filtered air. This will clean the air in a 20 x 20 x 8 foot shop six and a half times per hour.

The JDS AIR-TECH 2000 will remove 99% of dust particles as small as five micron and 80% of the particles as small as one micron.

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# THE CUT IS EVERYTHING!

## FREE - $45 IN SHARPENING COUPONS WITH EACH BLADE OR DADO SET

**$74**
**net cost to you (after using $45.00 in sharpening coupons at right) on purchase of our BEST SELLER 10" 40T today on SALE at $119. Receive with every FORREST Blade or Dado listed, nine-$5 sharpening coupons!!**

***Outperformed 36 other premium blades, both foreign and domestic!!***
Wood Magazine test, Sept., '93, pg. 45.

**The One Blade That Leaves A Smooth-As-Sanded Surface!!!**

Dear Mr. Forrest:
What a pleasure it is to find a product that is even better than expected. I am a long time owner of a Woodworker I (10"-60T) which I use with your 4" stabilizer. It has consistently produced cross cuts on my radial arm saw which look polished and are far superior than any produced using any other blade I have tried, but it is not good for ripping. When I recently purchased a new Delta 10" Contactor's Saw, I tried it with a couple of premium blades, including a specialized rip blade, as my principal use was ripping 1" oak planks. Although everything checked out, and the blade was sharp, I was not satisfied.

Fortunately, I ran into one of your magazine ads and, despite the price, I purchased a new Woodworker II (10"x1/8"-40T) with a 5" stabilizer. The first thing I did when I opened the package was to nick my finger on one of the teeth. *I have never seen a saw blade so sharp!* I immedialely had to test the new blade, now wearing gloves for the installation (doesn't take me long to look at a horseshoe).

The first cut was ripping a three foot piece of 1" thick oak. *I thought that I had mis-set the fence and missed the wood.* It was so quiet that I neither heard the cut over the machine noise, nor felt the resistance as I fed the piece into the blade at normal speed. The cut edge was flawless and could have been edge-glued without jointing. I then tried a cross cut on the same piece. It was every bit as smooth as the rip and every bit as quiet and effortless. I have since learned to hear the whisper of the cutting and to feel the almost sensual touch of the blade slicing through the wood. In over 40 years of making sawdust, I have never worked with so fine a blade. I have heard all my life that no combination blade could equal both dedicated rip and cross cut blades, but the WW II proves that to be an "old saw," (pun intended).

As soon as I realized what a teriffic tool my new WW II was, I immediately sent you the old WW I and the rip blade for re-sharpening. I have been using it for about six years, so maybe it has worn a bit.

Sincerely, Hank Meltzer Richardson, Texas

**GOOD ON ALL FORREST OR OTHER MAKES OF CARBIDE BLADES OR DADO SETS.** Total Savings $82 or more! Nine $5 sharpening coupons supplied with blade or dado. Offer good through June 30,1995
Must mention WOOD® mag. to receive coupons and extra bonus.

| WOODWORKER II | List | SALE |
|---|---|---|
| 14" x 40T x 1" | ~~$215~~ | $149 |
| 14" x 30T x 1" | ~~$195~~ | 139 |
| 12" x 40T x 1" | ~~$183~~ | 129 |
| 12" x 30T x 1" | ~~$162~~ | 119 |
| 10" x 40T x 1/8" or 3/32" | ~~$156~~ | 119 |
| 30T 1/8" or 3/32" | ~~$135~~ | 99 |
| 9" x 40T | ~~$146~~ | 109 |
| 30T | ~~$125~~ | 99 |
| *8-1/4" x 40T 3/32" | ~~$136~~ | 99 |
| 8" x 40T 3/32" | ~~$136~~ | 99 |
| 30T 3/32" | ~~$115~~ | 89 |
| 7-1/4" x 30T 3/32" | ~~$112~~ | 69 |
| **NEW 6" x 40T 3/32" | ~~$136~~ | 89 |

***NEW For Sears & Makita Table Saws **For Saw Boss**

FORREST,
WELL - I WILL BE D_ _ _ _ _ - READ YOUR STATEMENTS ABOUT YOUR BLADES AND ORDERED ONE EACH, WOODWORKER I & II. YOUR BLADES ARE AS ADVERTISED - WHICH IS A PLEASANT CHANGE IN TODAY'S WORLD, SINCE SO MANY CO'S ARE GOING OUT OF BUSINESS THESE DAYS - WILL PLACE THE FOLLOWING ORDER. DO NOT WANT TO BE WITHOUT YOUR BLADES, EVEN THOUGH I AM 71 YEARS OLD. ( ORDERED 4 MORE BLADES & 1 STIFFENER).

CARL KLAENHAMMER
CASPER, WYOMING

## UPGRADE YOUR CHOP AND SLIDING MITER SAWS WITH OUR CHOPMASTER

New specs • 5° Neg. Pts. & a flat, runout less than .002" for perfect, tight, smooth, splinter-free miter joints.
NEW AVAILABLE SIZES

| | | List | SALE |
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| Delta Sidekick 6-1/2" | 6-1/2" x 40T x 5/8" | $149 | $ 89 |
| Sears 8-1/4" & Delta | 8-1/4" x 60T x 5/8" | 170 | 99 |
| Hitachi 8-1/2" DeWalt 8-1/2" & Ryobi | 8-1/2" x 60T x 5/8" | 179 | 109 |
| Delta | 9" x 80T x 5/8" | 204 | 119 |
| Ryobi-Makita & all | 10" x 80T x 5/8" | 207 | 129 |
| DeWalt, Makita, B&D & Hitachi | 12" x 80T x 1" | 229 | 139 |
| Ryobi-Makita | 14" x 100T x 1" | 266 | 179 |
| Hitachi | 15" x 100T x 1" | 277 | 189 |

For good general purpose cuts use Woodworker II 30T & 40T or Woodworker I

Use small stiffener where possible

QUIET! ***Also help all your other blades to cut better.***
Use our 1/8" DAMPENER STIFFENERS, against one side

4" - $21
5" - $24
6" - $25

Tryable and RETURNABLE. CUTS NOISE to 1/2 or 1/4. Stops vibration, flutter, cutting noise and blade ring. Parallel and flat to .001 • 7" and larger available.

5/8" holes std. Boring up to 1-1/4" $7.50 extra. Others available. Add $2.50 Shipping.

**REDUCE NOISE 50%-75%**

## WOODWORKER I - For TABLE and RADIAL SAW

this trim and crosscut ALL PURPOSE blade gives scratch free POLISHED cuts on all materials RIP or CROSSCUT up to 2".
- All 60T and 3/32" *THIN* kerf 30° ATB and 5° face hook on 10" dia and under. 12" and 14" are 20° ATB 1/8" K.
- DOUBLE HARDER and 40% STRONGER carbide.
- THIN KERF:
  **Saves 1/3 wood loss** on each cut, radial or table. Feeds easy when used for moderate rip and crosscut on table saw. **Reduces "JUMP IN"** greatly for better "PULL CONTROL". Practically **eliminates bottom splinter** on RADIAL-CROSS CUT.
- Totally stops ALL bottom and top splinter on ply veneers in push-cut mode on RADIAL.
- Our STIFFENER STRONGLY RECOMMENDED AGAINST outside of blade only for best cuts.

Made and serviced in USA for your benefit.

| | List | SALE |
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| 14" x 60T x 1" 1/8" | $224 | $159 |
| 12" x 60T x 1" or 5/8" 1/8" K | 198 | 139 |
| 10" x 60T x 5/8" 3/32" K | 162 | 129 |
| 9" x 60T x 5/8" 3/32" K | 156 | 119 |
| 8" x 60T x 5/8" 3/32" K | 150 | 109 |
| New 8-1/4" x 60T x 5/8" 3/32" K | 150 | 109 |
| New 7-1/4" x 60T x 5/8" 3/32" K | 150 | 109 |

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***OUT PERFORMS 29 + 32 OTHER DADO SETS*** *WOOD Mag.* Oct. 91. pg. 62 63 "Best Value"

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NEW 3/32 Chipper & Shims incl.
"No tearout on all five woods tested." -*Fine Woodworking July/Aug. 1991*

NEW 6" D. 5/8" Bore • List $299/**SALE $269** • 10" D. 5/8" & 1" Bore • List $389/**SALE $349**
8" D. 5/8" Bore • List $321/**SALE $289** • NEW 12" D. 1" Bore • List $499/**SALE $449**

## DURALINE Hi-AT For TABLE & RADIAL SAW

(very good on chop saw too!) STOP SPLINTERING those SPLINTERY OAKS, HARDWOOD VENEERS and *thin* 2 SIDE LAMINATES ON PARTICLE BOARD.
FOR FASTER FEED RATES AND MORE ABSOLUTE SPLINTER CONTROL.

**DURALINE Hi-AT**

***Note:*** *Fine Woodworking Editorial Nov./Dec. 1988 No. 73, pg. 65, S.N. recommends high alternating top bevel (ATB) thin kerfs and large blade stiffeners for smoothest cuts on RADIAL SAW, etc.*

Jim Forrest, President and designer microscoping cutting edge.

All 5/8" holes. Boring up to 1-1/4" $7.50 extra
Larger holes - time basis. Shipping $4.50

| | LIST | SALE |
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| 7-1/4" x 60T 3/32" | $149 | $129 |
| 8" x 80T 1/8" & 3/32" | 202 | $169 |
| 9" x 80T 1/8" & 3/32" | 207 | $179 |
| 10" x 80T 1/8" & 3/32" | 207 | $159 |
| ***SPECIAL SALE10" ONLY $159*** | | |
| 12" x 80T x 1" 1/8" | 212 | $181 |
| 12" x 100T x 1" 1/8" | 253 | $215 |
| 14" x 80T x 1" | 232 | $197 |
| 14" x 100T x 1" | 266 | $226 |
| 16" x 80T x 1" | 262 | $223 |
| 16" x 100T x 1" | 294 | $243 |

CARBIDE IS THE HARDEST OF THE C-4 GRADES AND 40% STRONGER, NOT WEAKER!! For 50% to 300% longer life!

***FACT: Duraline Hi-AT with dampener/stiffener is the quietest blade on the market!***
You've probably read the recent articles on the new "quiet" blades. But the fact of the matter is a Forrest 80 tooth Duraline Hi-AT with blade stiffener cuts 50% quieter than those so-called "quiet" blades.

So order your saw blade and stiffener today and find out why Serious Woodworkers prefer Forrest Blades. Satisfaction guaranteed or full cash refund.

**WE RECOMMEND OUR FACTORY SHARPENING** as some local sharpening creates problems with **Micro-chipped edges** reducing blade life & cutting quality.
2-4 DAYS ON THESE AND ALL MAKES OF FLAT FACE & CONCAVE CARBIDE TIP SAWS.
SHIP VIA UPS. Typical 10 x 40T $15.00, 60T $17.75. Add return UPS $4.50 or 2nd Day Air $8.

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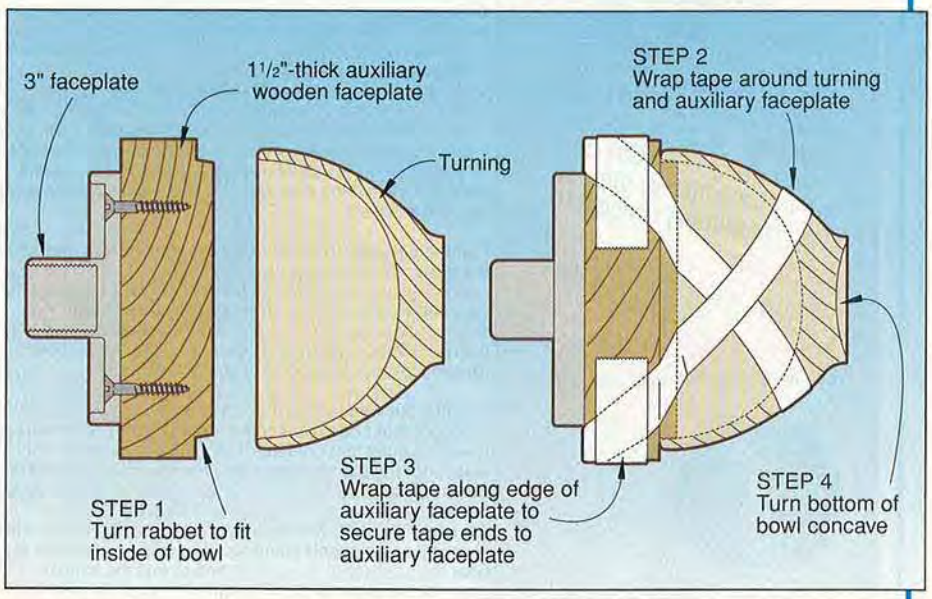
Circle No. 1322

*Continued from page 22*

## Poor man's lathe chuck ends telltale screw holes

*Unsightly screw holes in the bottom of a turning can detract from its beauty. And sometimes, the bottom won't sit flat enough to prevent rocking.*


3" faceplate
1½"-thick auxiliary wooden faceplate
Turning
STEP 2
Wrap tape around turning and auxiliary faceplate
STEP 1
Turn rabbet to fit inside of bowl
STEP 3
Wrap tape along edge of auxiliary faceplate to secure tape ends to auxiliary faceplate
STEP 4
Turn bottom of bowl concave

**TIP:** This low-tech lathe chuck solves both problems. To use it, proceed with your turning as usual—turn, sand, and add the finish. Then, use a parting tool to separate the turning from the auxiliary wooden faceplate. Using waste stock from the turning (or a separate faceplate with waste stock attached), turn a rabbet on the waste stock to fit snugly inside the top end of the turning, as shown in *Step 1*.

Next, secure the turning to the waste stock with masking tape as shown in *Step 2*, but don't place the tape over the base of the bowl. Wrap another band of tape around the faceplace to secure the ends of the crisscrossed pieces as shown in *Step 3*. Finally, in *Step 4*, turn on the lathe and turn and sand the base to a slightly concave shape. This will give you a blemish-free base that sits flat on a table.

*—from the* **WOOD®** *magazine shop*

*Continued on page 26*


# Here's the one thing Belgians don't waffle on.

The Robland X31 is as welcomed in European workshops as a home run in the World Series. We put together a 12" jointer, 12" planer, 10" table saw, 50" sliding table, and a shaper with a mortiser. No cheating. No compromises. Some 1100 lbs. of cast iron stability, with three separate 3HP motors. It stays put. It stays true. and it stays neatly in a little corner of your shop. That's why Belgians call the Robland X31 The Intelligent One Man Shop. About the only thing you can't make on it is breakfast.

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Circle No. 615

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**12" Compound Miter Saw $809**

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|---|---|---|
| 2012 | 12" Planer | 538 |
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| 2708W | 8 1/2" Table Saw | 297 |
| 3612BRA | Plunge Router | 173 |
| 4301BV | Jig Saw | 157 |
| 5007NBK | 7-1/4" Circ. Saw | 127 |
| 5090DW | 3-3/8" Cordl's Saw | 137 |
| 5090D | tool only | 80 |
| 5402A | 16" Beam Saw | 529 |

| | | |
|---|---|---|
| 6095DWE | 9v. Cordless-2batt. | 137 |
| 6405 | 3/8" Drill | 53 |
| 9820-2 | Sharpener | 204 |
| 9901 | 3 X 21 Belt Sander | 129 |
| 9924DB | 3 X 24 Belt Sander | 183 |
| BO4510 | Square Pad Sander | 49 |
| BO5000 | Random Orbit Sander | 68 |
| JR3000V | Recip-Saw | 134 |
| LS1030 | 10" Miter Saw | 195 |
| LS1020 | 10" Miter Saw | 228 |
| N1900B | 3" Planer Kit | 129 |
| N9501B | Mini Grinder Kit | 98 |

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| ML900 | 9V Flashlight | 36.00 |

*AIR MAKITA*

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| AN8300 | Framing Nailer | 439 |
| AN451 | Coil Roofer Nailer | 398 |
| AF501 | Brad Nailer | 277 |

## Makita

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|---|---|---|
| MAC1000 | 1-1/2hp Compressor | 299 |
| MAC2000 | 2hp Oilless Compressr | 354 |

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| #9 | self centering bits | 7.99 |
| #12 | for hinges | 35.99 |
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**Biscuit Joiner $147**

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|---|---|---|
| 100 | 7/8 hp Router | 101 |
| 1700 | HeatGun | 73 |
| 2620 | 3/8" Drill 4.5 amp | 87 |
| 2621 | 3/8" Keyless Drill | 88 |
| 310 | Laminate Trimmer | 144 |
| 312 | Offset Trim Router | 157 |
| 332 | RO Sander | 65 |
| 347 | 7" Circular Saw | 126 |
| 743 | Left hand saw | 127 |

PORTER-CABLE PROFESSIONAL POWER TOOLS

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| 361 | 3X24 Belt Sander | 181 |
| 363 | 4X24 Belt Sander | 190 |
| 410 | Betterly™ Underscribe | 147 |
| 411 | Betterly™ MiterFold | 164 |
| 447 | 7-1/4" Framer Saw | 133 |
| 5008 | 12" Dovetail Jig | 77 |
| 511 | Door Lock Kit | 138 |
| 5116 | 16" Dovetail Jig | 252 |
| 6611 | 3/8" Drill 5.5 amp | 123 |
| 6614 | 1/2" Drill | 127 |
| 6615 | 1/2" Keyless Drill | 127 |
| 666 | 3/8" Drill | 124 |

PORTER-CABLE PROFESSIONAL POWER TOOLS

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|---|---|---|
| 690 | 1-1/2 hp Router | 139 |
| 693 | 1.5hp Plunge Router | 168 |
| 6931 | Plunge Base | 72 |
| 695 | Router Table w/motor | 215 |
| 696 | Router Table only | 127 |
| 7116 | 24" Doevtail jig | 292 |
| 7399 | Drywall Cutout | 78 |
| 743 | 7-1/4" Right hand Saw | 127 |
| 7518 | Vari Sp 3 hp Router | 266 |
| 7519 | 3 hp Router | 232 |
| 7536 | 2 hp Router | 201 |

PORTER-CABLE PROFESSIONAL POWER TOOLS

**345 6" Saw Boss $103**

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| 7537 | 2 hp D-Handle Router | 207 |
| 7538 | 3 hp Plunge Router | 234 |
| 7539 | VS Plunge Router | 268 |

PORTER-CABLE PROFESSIONAL POWER TOOLS

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|---|---|---|
| 7549 | Jig Saw | 133 |
| 7800 | Drywall sander | 328 |
| 7810 | Vacuum | 252 |
| 9118 | 3 1/4" Planer Kit | 204 |
| 9314 | Trim Saw Kit | 151 |
| 9345 | Sawboss w/ case | 123 |
| 9690 | 1.5 hp Router w/case | 144 |
| 96645 | Screwgun w/ case | 128 |
| 97310 | Trimmer Kit | 193 |
| 973366 | RO Sander w/case | 136 |
| 9743 | 7-1/4" Saw Kit | 139 |

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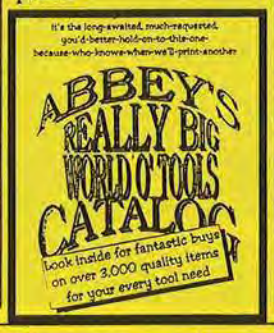
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## Milwaukee

| | | |
|---|---|---|
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| 0228-1 | 3/8" 0-1000rpm Drill | 108 |
| 0229-1 | 3/8" Keyless Drill | 108 |
| 0234-1 | 1/2" Magnum Drill | 128 |
| 0236-1 | 1/2" Magnum Kit | 148 |
| 0238-1 | 1/2" 0-850rpm Drill | 128 |
| 0239-1 | 1/2" Keyless Drill | 128 |
| 0244-1 | 0-600 rpm Magnum | 127 |

| | | |
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| 0375-1 | 3/8" Close Qtr Drill | 128 |
| 0379-1 | 1/2" Close Qtr Drill | 148 |

| | | |
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| 0407-1 | Cordless Drill Kit-2batt | 172 |
| 0421-1 | 12V Cordl's HammerDrill | 189 |
| 0567-1 | Drain Cleaner | 234 |
| 3300-1 | Rt Angle Drill | 189 |
| 3107-1 | VS Rt Angle Drill | 213 |
| 5192 | Die Grinder | 174 |

## DEWALT

**DW682K**
**Biscuit Joiner $218**

| | | |
|---|---|---|
| DW100 | 3/8" Drill | 67 |
| DW106 | 3/8" Keyless Drill | 73 |
| DW411 | Palm Sander | 58 |

| | | |
|---|---|---|
| DW930K | Cordless Saw | 198 |
| DW935K | Cordless Saw | 219 |
| DW972K2 | 12V Cordless drill | 188 |
| DW974K | 14V Cordless drill | 188 |

## DEWALT

**DW705**
**12" Compound $358**

## Milwaukee

**6494**
**10" Compound Miter $309**

| | | |
|---|---|---|
| 5362-1 | 1" Hawk Hammer | 328 |
| 5365-1 | 1" Hawk Hammer Kit | 348 |
| 5369-1 | 3/4" D-handle Falcon Kit | 238 |
| 5371-1 | 1/2" Hammer Drill | 184 |
| 5375-1 | 1/2" Hammer Drill Kit | 178 |
| 5392-1 | 3/8" Hammer Drill | 126 |
| 5397-1 | 3/8" Hammer Drill Kit | 138 |
| 5460 | 7" Polisher | 168 |

Milwaukee

| | | |
|---|---|---|
| 5682 | 2 Hp Router | 165 |
| 5936 | 4 x 24 Belt Sander | 227 |
| 6008 | 1/3 Sheet Sander | 123 |
| 6010 | 1/2 Sheet Sander | 123 |
| 6140 | 4 1/2" Grinder | 94 |
| 6142 | 4 1/2" Grinder Kit | 123 |
| 6175 | 14" Chop Saw | 278 |
| 6266 | NEW!! Jig Saw | 187 |
| 6365 | 7-1/4" Circular Saw | 119 |
| 6366 | 6365 w/Carbide bld | 128 |
| 6368 | 7-1/4" Saw Kit | 138 |
| 6460 | 10" Circular Saw | 268 |
| 6490 | 10" Miter Saw | 254 |
| 6491 | 10" Miter Saw w/80t Bld | 274 |
| 6527 | VS Super Sawzall | 171 |
| 6528 | VS Super Sawzall | 169 |

Milwaukee

| | | |
|---|---|---|
| 6539-1 | Inline Screwdriver | 74 |
| 6546-1 | 2 spd Inline Screwdriver | 81 |
| 6547-1 | 2 spd Screwdriver Kit | 108 |
| 6758-1 | Drywall Screwgun | 98 |
| 6767-1 | Screwdriver Kit | 137 |
| 8975 | Heat Gun | 55 |
| 8980 | Heat Gun Kit | 91 |

**6535** *Dual range VS Sawzall* **$115**

## BOSCH

**1581VS**
**$144**
**VS**
**Orbital Jigsaw**

| | | |
|---|---|---|
| 3283DVSK | RO Sander Kit$ | 117 |
| B4050 | *New!* Inline Jig Saw | 113 |
| 1139VSR | 3/8" Hammer drill | 139 |
| 1347A | Mini Grinder | 99 |
| 11222EVS | SDS RotoHammer | 429 |

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**2872K2**
**with 2 batteries**
**12V $188**
**2874K**
**14.4V $208**

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|---|---|---|
| 1180 | 1/2" Drill | $ 113 |
| 2037 | Drywall Screwgun | 96 |
| 2037W | Drywall gun w/50ft cord | 119 |
| 2038 | HD Screwgun | 98 |
| 2660 | Drywall Screwgun | 86 |
| 2670 | 1/2" Impact Wrench | 149 |
| 2721 | 1.5hp Router 1/2" collet | 148 |
| 3105 | Reciprocating Saw | 148 |
| 3339 | 3hp VS Plunge Router | 268 |
| 4075 | 7" Wildcat Grinder | 165 |

## DELTA

**37-070**
**$247**
**6" Table Top Jointer**

| | | |
|---|---|---|
| 14-650 | Hollow Mortise Chisler | 279 |
| **Set of 4** | **Mortise bits** | **99** |
| 22-540 | 12" planer | 388 |
| 28-180 | 10" band saw | 163 |
| 31-050 | 1" belt sander | 74 |
| 31-080 | 1" Belt 5" Disc Sander | 88 |
| 31-340 | 1" Belt 8" Disc Sander | 203 |
| 31-460 | 4" Belt 6" Disc Sander | 126 |
| 32-100 | Plate Joiner | 258 |
| 36-040 | 8" Compound Miter | 154 |
| 36-090 | Sidekick 10" Miter Saw | 213 |
| 36-220 | 10" Compound Miter | 228 |
| 40-150 | 15" Scroll Saw | 115 |
| 40-560 | 16" Scroll Saw | 177 |
| 40-640 | 20" Scroll Saw | 298 |
| 35-617 | 10"x50T Carbide Blade | 34 |
| 35-677 | 14"x108T Carbide Blad | 75 |

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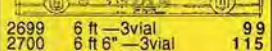
|---|---|---|
| 2464 | 24" w/ hand hole | 43 |
| 2469 | 36" w/ hand hole | 46 |
| 2467 | 48" w/ hand hole | 49 |
| 2468 | 72" w/ hand hole | 99 |

| | | |
|---|---|---|
| 2501 | 10" Pocket level | 25 |



| | | |
|---|---|---|
| 2699 | 6 ft —3vial | 99 |
| 2700 | 6 ft 6" —3vial | 115 |
| 2701 | 8 ft —3vial | 125 |

## RYOBI

**OSS450**
**Spindle Sander $159**
*AP10 Replacement Blades 24.95*

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|---|---|---|
| BS900 | NEW! 9" Band Saw | 168 |
| DP80 | 8" Drill Press | 99 |
| DP100 | 10" Drill Press | 119 |
| DS1000 | Detail Sander | 39 |
| J60VK | JigSaw Kit | 85 |
| TRMK2 | Trimmer w/ 2 bases | 99 |
| RJ100VK | Reciprosaw | 99 |
| RS115K | RO Sander Kit | 69 |
| SC162 | Scroll Saw | 119 |
| SC162VS | VS Scroll Saw | 169 |
| TS251 | 10" Miter Saw | 169 |
| TS254 | 10" Miter Saw | 197 |
| TS380 | 15" Miter Saw | 365 |

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| 250SK | 18 G 3/4- 2" Kit | 164 |
| 350K | 16G 3/4- 2" Kit | 194 |
| 565T | 1- 2-1/2" Finish Gun | 204 |
| 626SK | 1/4"Crown 1" StaplerKit | 104 |
| 8290 | 6d-16dFrming Nailer | 314 |

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| 94-100 | | |
| JS102 | New Biscuit Joiner | 179 |
| EDS132B | 13V Cordless Drill | 209 |
| TR215 | 8"Compound Miter Saw | 349 |
| LU85M010 | 10" 80T Finish | 58 |
| LU84M011 | 10" 50T Combo | 40 |
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| LU85M015 | 15" 108T Finish | 99 |
| LU82M010 | 10" 60T Chipboard | 45 |
| LU89M010 | 10" 72T Aluminium | 57 |
| LU92M010 | 10" 60T Corian® | 55 |
| LU98M010 | 10" 80T Laminates | 67 |
| LU73M010 | 10" 60T Crosscut | 45 |

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| C10FA | 10" Miter Saw | 269 |
| C10FC | 10" Comp'd Miter | 258 |
| C15FB | 15" Miter Saw | 669 |
| NR83A | Framing Nailer | 398 |

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## REG

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| STSE380 | Jig Saw | 59 |
| VS280 | 1/2 sheet sander | 39 |

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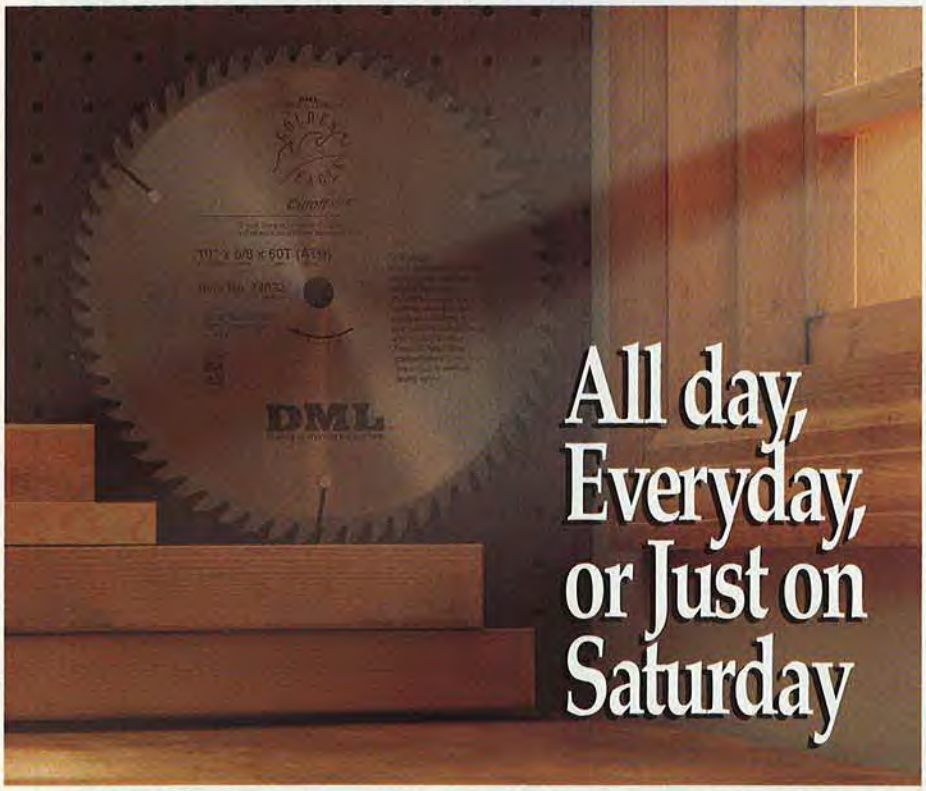


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## TIPS FROM YOUR SHOP (AND OURS)

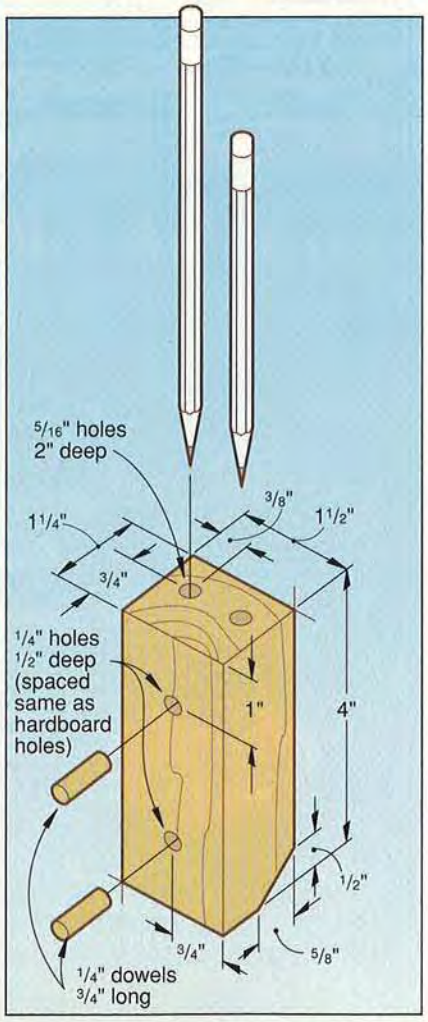
*Continued from page 24*

### Scrapwood block puts pencils at your fingertips

*Pencils disappear frequently around most workshops. Why? Because few people designate a place to put them.*

**TIP:** Build this simple pencil holder, and you can store pencils anywhere you have perforated hardboard. Cut the block from scrapwood to the dimensions shown, and glue two ¼" or ⅛" dowels (depending on the size of holes in your hardboard) into holes in the back. Measure your perforated hardboard to get the exact spacing for the dowels. Mount the holder alongside the other tools, and you'll always know where to go for the pencils.

***—Greg Galchutt, Brookings, Ore.***




*Continued on page 28*

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## TIPS FROM YOUR SHOP (AND OURS)

*Continued from page 26*

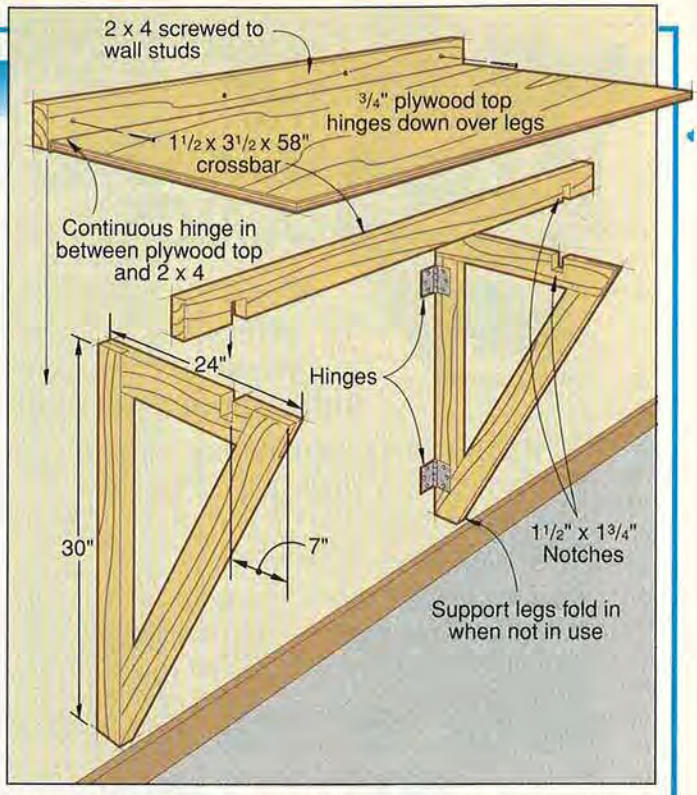
### Wall-mounted worktable folds down to save space

*A big worktable eats up a lot of room in any shop. And even a knock-down worktable demands some storage space.*

**TIP:** Here's a worktable that folds flat and protrudes only 2¼" from the wall. To build it, cut a 2×4 as long as your intended worktable, and screw it to your wall at a comfortable worktop height. Use lag screws and make sure they penetrate at least 2" into a wall stud. (If you have masonry walls in your workshop, use concrete screws.)

Next, build the support legs from 2×4s as shown. Join the three pieces of each support leg with half-lap joints glued and screwed together with three screws per joint. Cut a notch in the top of each support leg, as shown, to accept the crossbar. Fasten the support legs on the wall with hinges. On the leaf of the hinge that mounts to the wall, use screws long enough to penetrate 2" into the wall studs or concrete.

Attach the plywood tabletop to the wall-mounted 2×4 with a continuous hinge. Cut and notch the crossbar to lock the legs in place. Now whenever you need to store the table, remove the crossbar, fold the legs flat against the wall, and drop the tabletop down.


2 x 4 screwed to wall studs
¾" plywood top hinges down over legs
1½ x 3½ x 58" crossbar
Continuous hinge in between plywood top and 2 x 4
24"
Hinges
30"
7"
1½" x 1¾" Notches
Support legs fold in when not in use

*—Keith Juryea, Birdsboro, Pa.*

*Continued on page 30*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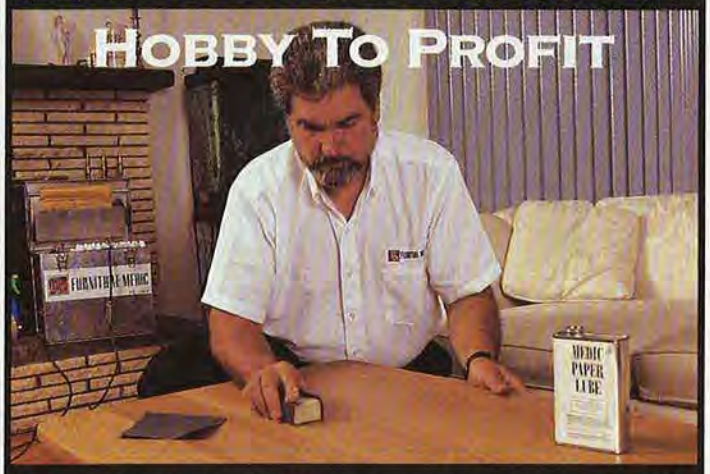

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*Continued from page 28*

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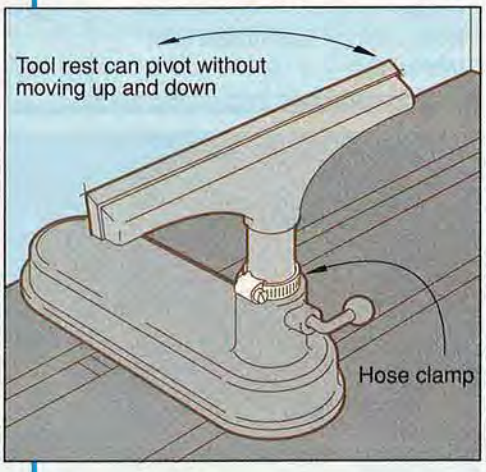
***—William D. Phillips, Punxsutawney, Pa.***




## A FEW MORE TIPS FROM OUR WOODWORKING PROS

- Having trouble with small chips breaking off as you carve a delicate texture? In the fish carving project on *page 76*, you'll discover how wetting the carving can help.
- On *page 46*, find out how to dress up a turning with silver. You can use this technique with copper and brass too!
- Don't cook much pasta? Then make just the spoon from our spaghetti set on *page 60*. It comes in handy for cooking and serving, no matter what food you like.

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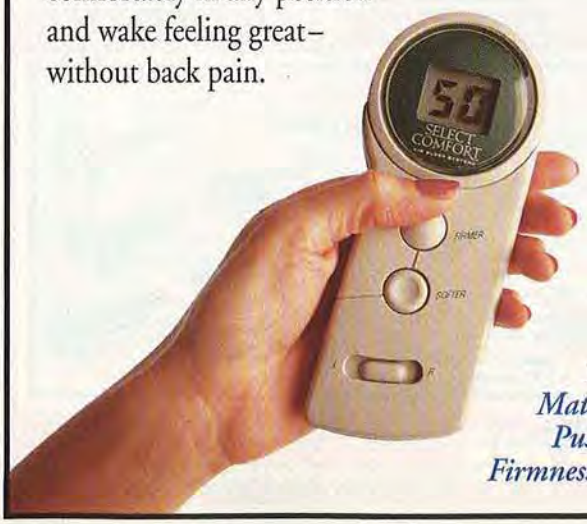


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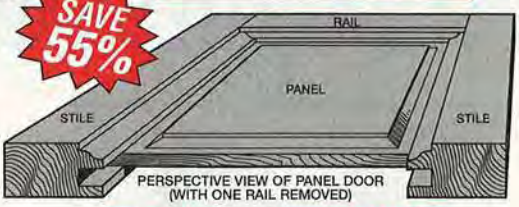

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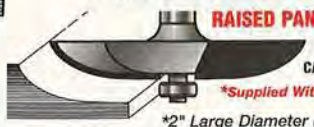

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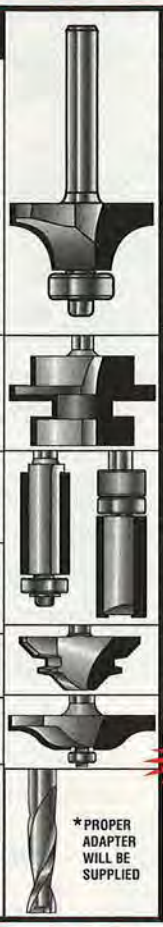

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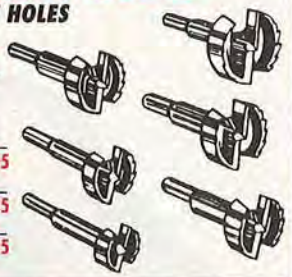

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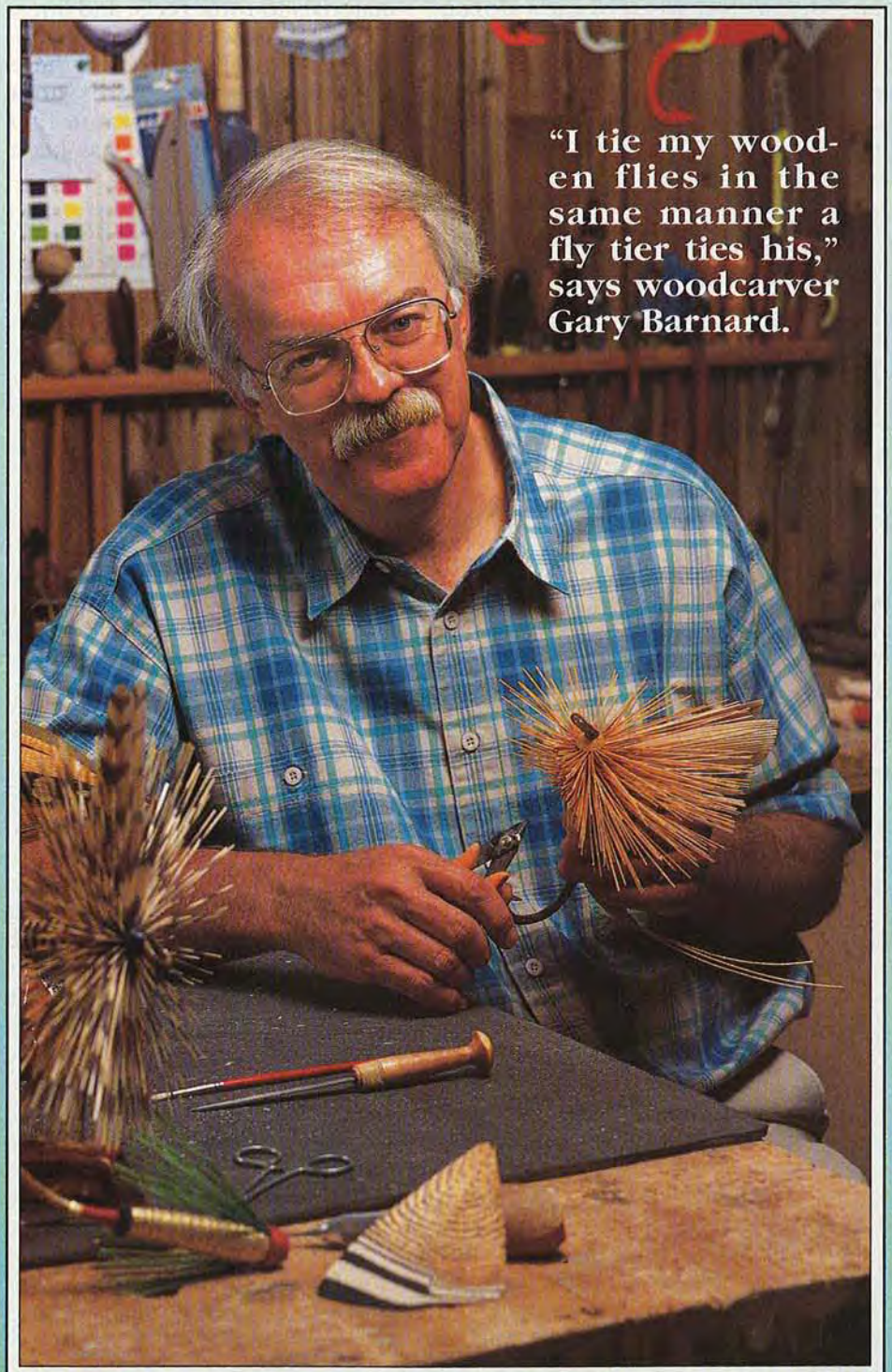
# CARVING'S Izaak Walton

## Colorado trout fisherman and carver Gary Barnard creates his artificial flies in a big way.




Fly fishing is theater, with the water as a stage, the fisherman as director, and the fly as actor. At least that's how Gary Barnard looks at it. And he's no novice when it comes to angling theatrics.

A native of Colorado, Gary, 53, was raised with a fly rod in his hand. As an adult, he applied his graphic-design talent and dexterity to tying flies. Now, as a full-time carver living in Lakewood, Colorado, he still focuses on artificial flies, but ones ten times life-sized and made of wood.

"A fly is nothing more than a caricature, a cartoon, of a living thing—an insect, fish, or tiny animal," says Gary. "And when it's cast to the surface of a stream, it's being put on stage to act out a role. If a fish hits it, that's just a bonus. The reward is the theatrics of it all, from the waders and gear to the scenery, and the way the fly behaves on the water."

Gary pauses and grins as he looks at the giant, gaudy, dry fly in his hands. Then he con-

*Continued*

Print this article

"A fly is nothing more than a caricature, a cartoon, of a living thing – an insect, a fish, or a tiny animal."

## Fly fishing: a heritage of centuries

In 250 A.D. Roman Claudius Aelianus wrote this about fly fishing: "The fishermen wind red wool around their hooks and fasten to the wool two feathers that grow under a cock's wattles and which are the colour of dark wax." His graphic description of the technique used by fishermen on a river in what is now Bulgaria marks the first written mention of fly fishing. But we know from Egyptian wall paintings dating to 2000 B.C. depicting men with fishing rods that fishing was a sport even then.

The first written fly-fishing how-to book, though, came from Dame Juliana Berners, an English gentlewoman, who in 1496 not only covered the technique in detail, but prescribed a dozen effective fly patterns for catching trout. And about 150 years later, the most famous fisherman of all, Izaak Walton, in his book *The Compleat Angler*, elaborated on the necessary tackle and tactics for trout fishing on the spring-fed streams of Staffordshire, England.

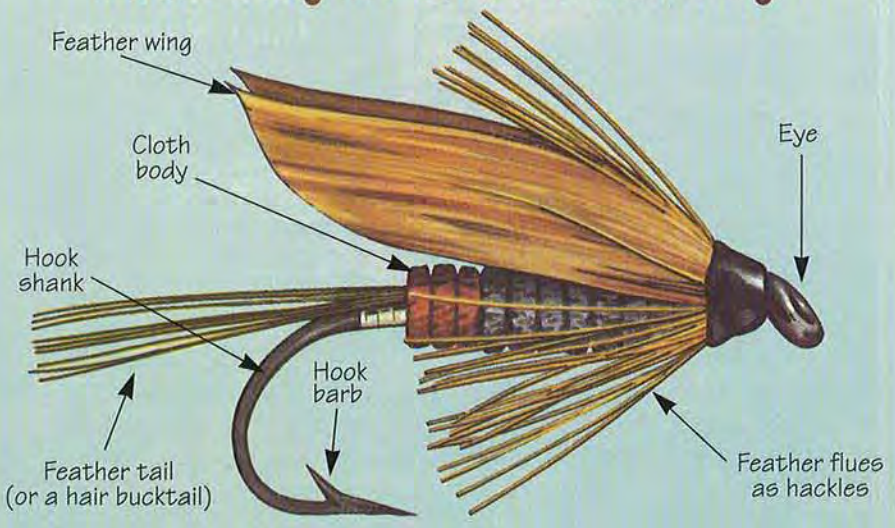
So it's from this centuries-long heritage that today's fly fishers draw their knowledge, equipment, and technique. And despite the addition of aerospace materials to rods, reels, and lines, the basic presentation of a hand-tied artificial fly (of which there are thousands of patterns) to a wary trout or other game fish remains the same as it has been for at least 500 years.

tinues. "Fly fishing is pure fantasy and imagination. The whole sport is an art—even if that statement seems like a cliche. And yes, it's sometimes important to catch fish, but just to see that fly run and float down the river is what's most important to me. And fly tying is an extension of all that."

### Tying flies: It's part technical, part personal

By the Roman writer Aelianus' description, flies in his time were fairly simple things. But as fly fishing has evolved, so has the fly. And the fly tier.

A fly tier must be a highly skilled technician, yet part naturalist, part artist, and part engineer. He must know the vastly differing materials required—everything from game-bird feathers for hackles (see the drawing, *above*) to squirrel hair for bucktails and the pieces of feather flue called herls used for bug bodies, plus upturned hooks and downturned hooks, and on and on. The naturalist aspect also implies an entomologist's knowledge in order that all the feathers, a type of cloth known as chenille, and hair eventually resemble something "buggy." The artist part is the personal interpretation of nature in the fly being tied. Then finally, he has to understand aerodynamics, or else his creation will prove uncastable and useless.



**This wooden version of a Ben Bent wet fly pattern tied by Helen Shaw measures 9½" long..**

In wood, Gary has discovered that only his materials have changed. "I try to replicate the process of fly tying as much as I can. In effect, I'm tying a wooden fly," the craftsman explains.

And that's precisely what Gary set out to do five years ago when he gave up his 25-year career as a graphic designer. He had been carving wood as a hobby for a long time, but knew he was looking for something just a bit out of the ordinary.

"I got to thinking that maybe

The Evening Star, a classic salmon fly, is Gary's 15"-long original version of a pattern tied by Major J. H. Hale in 1895.

This detail photo of The Evening Star shows how Gary carved the eye to simulate a twisted-gut loop and the body set with hackles.

there was a way to combine all my skills: the illustrator, the sculptor and carver, the fly tier," Gary says. "So I decided to try wooden flies, large ones.

"You see, people look at artificial flies, yet they really don't appreciate the art that they represent because what they're looking at is so tiny," Gary continues. "Even the fly fisher may appreciate them only to the extent that they imitate natural fish food. But if they were made really big, there might be more appreciation for the art."

## What species makes the perfect fly wood?

Gary knew the traditional materials for fly tying. How could he imitate them with wood? It wasn't easy. "It took me a year to find just the right wood, then see how thin I could make it for feathers," he says. "I also learned how to dye it and to maintain its stability after it was wet, bent, and dried."

The fly tier made some of his first wooden flies from pine, which was okay but not perfect. Next, he tried birch, and even black walnut, but there were problems. "There's a point to which you can take most hardwoods where they become so thin that they're brittle as glass," he says. "On the opposite end, pine and basswood are so soft that they won't hold texture very well. So I ended up relying on yellow poplar for bodies and wings, although I still use a tiny bit of basswood. For hackles and tails, I split bamboo and cane (see photo on *page 34*)."

According to the carver, yellow poplar may be a bit tougher to work than basswood, but the species has its advantages, especially for flies. "I've figured out that instead of trying to find absolutely straight-grained wood like basswood that's dull and boring with no color to it, I can get straight-grained yellow poplar. Yet, it will have a mottling of color and hues, from a dark, blackish green in the heartwood to white as can be in the sapwood. And all those pieces get used for different things: white, when it's appropriate, for wings, dark wood for the hook, greenish wood for the body. Using the wood the way it should be used is just as important as making the fly the way it should be tied."

## Carving dry flies, wet flies, and nymphs

Fly fishing for trout and salmon primarily developed on the waters of England, Ireland, Scotland, and Wales. Today, the sport reaches all frontiers of the globe, because where no native trout and salmon species existed, the fish were introduced. Artificial flies attract other fish, too, including freshwater pike and saltwater bonefish. That's why the array of fly patterns available seems endless. Here are some basic classifications (a fly tier or serious fly fisher would add many more):

*Dry flies* float atop the water, buoyed by their feather parts to imitate a newly hatched insect, such as a mayfly. *Wet flies* work underwater, sunk by bits of lead or weighted line to mimic swamped bugs, swimming larvae, and other potential fish food. *Nymphs* are also wet flies, but have emerged as a separate type of fly because they portray living underwater creatures, including freshwater shrimp and insects called midges. And, not surprisingly, there are flies tied that represent nothing at all. Named *attractors*, their flash and dash tease a fish into hitting.

*Continued*

A closeup of The Colonel shows the wing texturing, the detailed carving of the body wrap, and the thin, split-bamboo hackles.

This classic salmon fly called The Colonel is a mixed-wing pattern that dates back to the late 1800s. Gary's version is 15" long.

Within each type of fly classification, there may be hundreds of patterns and variations. Some go back to the earliest days of fly fishing. Many are more modern—in fact new patterns are tied every day. Their names can reflect the original tier, the creature they represent, or just a fantasy. Gary knows this rich legacy of fly fishing, yet like most tiers, he isn't afraid to interpret, even if the flies he makes are of wood.

"Some flies are intended to replicate certain bugs. For instance, wet butterflies. Imagine someone taking a butterfly by the nose and dragging it through the water—that's what a tier is trying to replicate. And if I can, I try to hit a happy medium between copying the actual bug and doing the fly as it was intended to be as a tied pattern," says Gary. "But I don't do scale models. My flies are representational. So buying a wooden fly from me is like buying a real fly from a tackle shop. Each one is different, even in the same pattern. Like a cook, I change the ingredients a little each time.

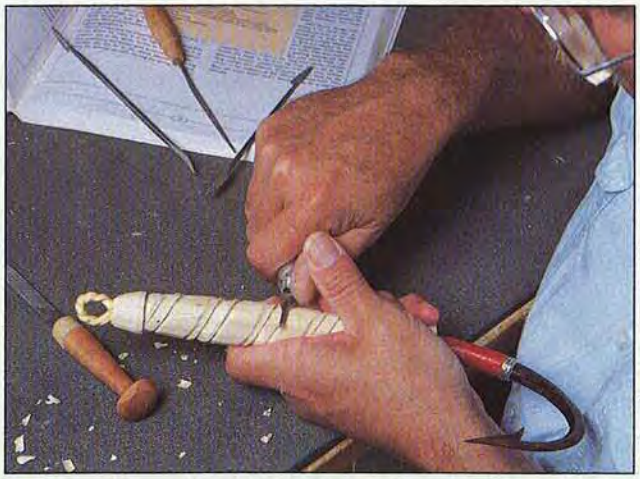
## A recipe for a wooden fly begins with the hook

Gary's first wooden fly was a dry-fly pattern called a quill. Originally created to ride high on tumbling streams, it was heavily hackled, as is The Colonel, shown in the photo *left*.

"I made it all with hand-carving tools," Gary recalls. "The body and wings were all textured, and I made the hackles from pine that I peeled down to about the diameter of a toothpick. And I left it all naturally colored with a clear finish. It was a pretty piece, but after that first one I knew that a natural finish—and pine—was not always the way to go."

Today, with yellow poplar and bamboo, plus dyes, stains, and some paint, he feels that he can

## DETAILS OF TYING A WOODEN FLY



*Left:* After carving, shaping, and finishing the hook, Gary hand-carves the wrap of the fly body along the shank. His carving imitates the real material.

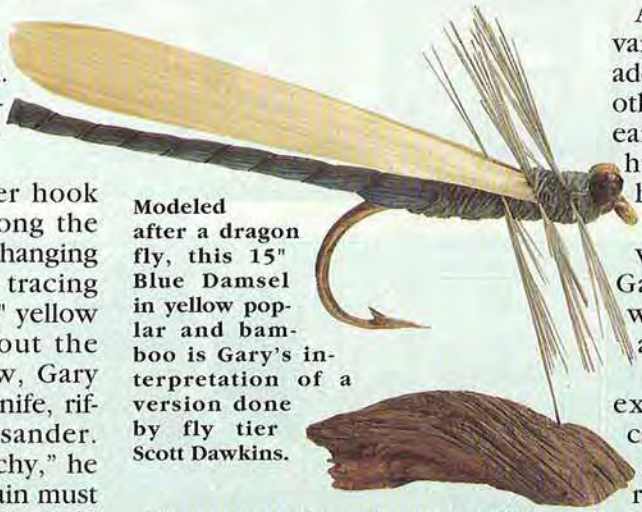
*Right:* For the individual feather flues called hackles on a real fly, Gary splits bamboo down to 1/32". To curl the hackles, he steam-bends them singly or in bundles. Dye gives them color.

## "Imagine someone taking a butterfly by the nose and dragging it through the water...that's what a tier is trying to replicate."

represent any of the vast materials in the recipes that a fly tier draws from. He also follows the general order in which a real fly is made.

Gary selects the proper hook shape and size from among the many cardboard patterns hanging on the wall. Then, after tracing the pattern onto 1" or 1¼" yellow poplar stock, he saws out the hook with a jigsaw. Now, Gary shapes the hook with a knife, riffler files, and a 1" belt sander. "Working the bend is touchy," he says. "For strength, the grain must run with the hook shank. This means that the bend runs cross-grain. It's here, and at the hook eye, that the wood can snap."

When the hook and barb are carved, Gary fine-sands the wood to ready it for finishing (for now, he leaves the body part uncarved). He explains: "I then oil-stain the hook and varnish it because the finish actually toughens the wood for handling."



**Modeled after a dragon fly, this 15" Blue Damsel in yellow poplar and bamboo is Gary's interpretation of a version done by fly tier Scott Dawkins.**

### How to imitate materials in wood

A fly tier tying a real fly has several choices of material for the body: winds of fuzzy cloth called chenille, colored thread, clipped deer hair, shiny Mylar ribbon, bright braid, or combinations of them. To imitate the real thing, Gary carves thread wraps with a series of stop cuts and grooves with a knife. For fluffier chenille, he switches to a Foredom power carver. For shiny Mylar and similar materials, he has a special technique. "I lay-in tiny flat cuts—like chip carving. Then, after the wood is dyed, I can let the varnish pool in those places to catch the light and reflect the color."

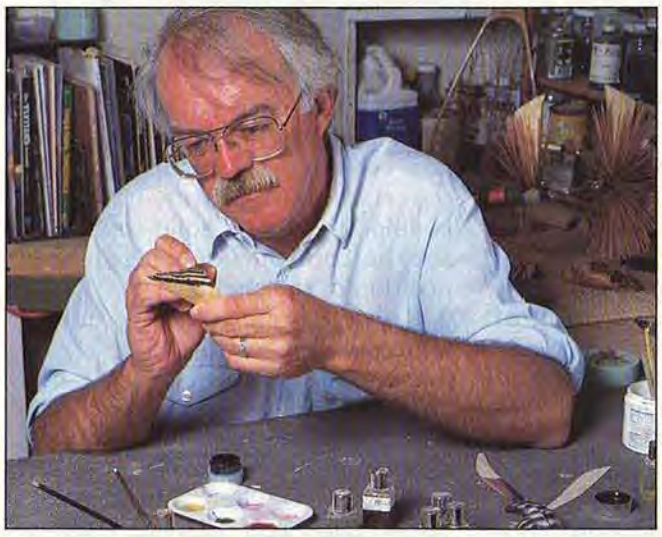
Although Gary prefers dyes and stains because he likes the wood grain to show, he uses paint where pearlized material would be used. "I can simulate pearlized material by starting with white stain, then dyeing it with dapples of pink, blue, and green" he says. "then, if I varnish it while the dye is still wet, the colors blend together quite nicely."

After Gary carves, colors, and varnishes the entire fly body, he adds the wings, hackles, and any other parts, such as tails, crafted earlier. The wings, for instance, he makes from resawn stock hand-planed to less than 1/16" thick. Then, he textures them with a veining gouge and file. Gary next dampens the wood with water, bends it to shape, and lets it dry.

With all the handwork, you'd expect Gary's wooden flies to carry sky-high price tags. But no. His prices begin at $150 and range up to $800 and possibly more, depending on the finished size and the complexity of the requested pattern. "The price of custom work actually reflects what someone might spend for a collectible fly from a noted tier of the past," says Gary. He chuckles. "As I said, fly fishing is all theater, and the fly fisherman is particular about choosing his costume, right down to the fly."♣

### Casting about for a wooden fly?

For a descriptive price list of Gary's fly patterns in wood, write him (enclose a SASE): Gary Barnard, Fishfeathers & Wood, 815 Hoyt St., Lakewood, CO 80215. Or call 303/237-4082.



***Left:*** **To color the thin wings of yellow poplar and other parts, the woodcarver relies on dyes and stains that he mixes himself. Often thinly applied, they allow the wood grain to show through.**

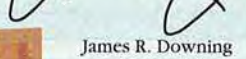
***Right:*** **After drilling holes in the body, Gary glues in the bamboo hackles. Depending on the dry-fly pattern he's "tying," a fly can have as many as 300 of them.**

Written by Peter J. Stephano Photography: Tim Murphy/Foto Imagery Illustration: Jim Stevenson

# A HARDWORKING ADAPTATION OF A ONE COOL

**With so many traditional icebox plans on the market, I decided that something different might be in order. So I asked Bob Colpetzer, a regular design contributor to *WOOD*® magazine, if he had any ideas. After researching the subject, Bob showed us many configurations used in building yesterday's iceboxes. Our favorite is the "ice chest," similar to the one shown at *right*.**

**This project offers ample storage for afghans and blankets. And it's also the right size for use as an entertainment center.**



James R. Downing
Design Editor

## Start with the carcase and lid

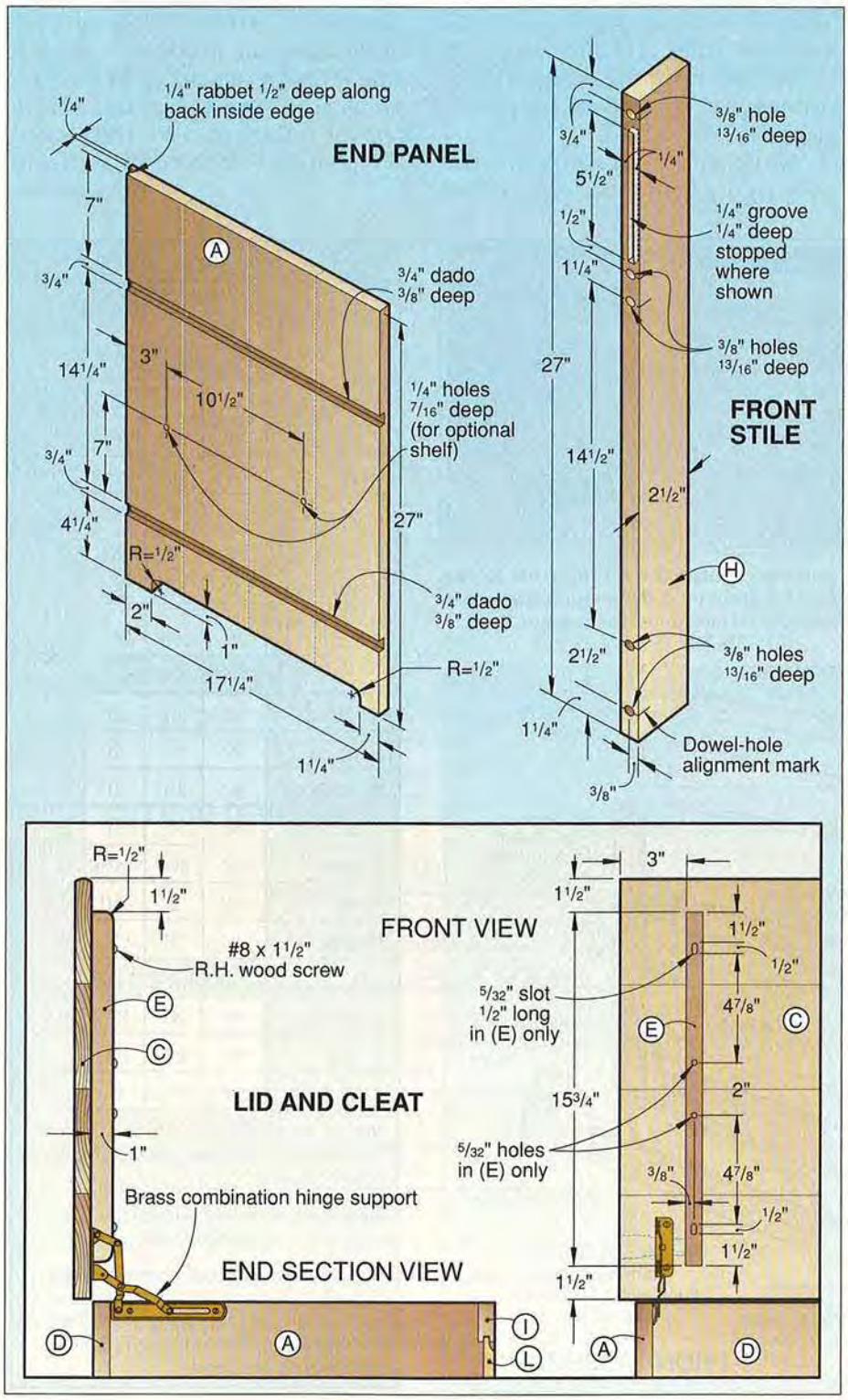
**1** Edge-join enough solid stock to form the end panels (A), fixed shelves (B), lid (C), and upper back (D). See the Cutting Diagram and the Bill of Materials for reference. (To minimize warping of these wide panels, we edge-joined boards about 4½" in width and alternated the end grain. Also, we formed our panels so that they are about 1" extra in length and ½" extra in width initially. This allowed us to crosscut both ends of each laminated panel flush and square and trim both edges. If you're using the project as an entertainment center, consider adding a ¾×17×34" solid oak shelf. See the End Panel drawing for the position of the shelf.

**2** Rip and crosscut the edge-joined oak panels (A, B, C, D) to the finished size listed in the Bill of Materials.

**3** Mark and then cut the ¾" dadoes on the *inside face* of each end panel (A) where dimensioned on the End Panel drawing. Using a

# TURN-OF-THE-CENTURY ICE CHEST

# CABINET




narrower dado blade, cut a ¼" rabbet ½" deep along the back inside edge of each end panel. Also, if you plan on adding the optional shelf, drill a pair of ¼" holes 7/16" deep in each side panel where shown on the drawing.

**4** Mark the shape, and then bandsaw the notch along the bottom end of each end panel. Use a 1"-diameter drum sander to sand the radiused corners smooth.

**5** Fit your table-mounted router with a ½" round-over bit and fence as shown in the Lid Edge detail accompanying the Exploded View drawing. Rout the front and ends (not the back edge) of the lid (C).

**6** To minimize the chances of the lid warping, cut a pair of cleats (E), and screw them to the bottom of the lid where shown on the Lid and Cleat drawing.

**7** Cut the lower back (F) to size, and cut the radiused notch to shape along its bottom edge.

**8** Cut a ½" rabbet ½" deep along both ends of the upper and lower backs (D, F) where shown on the Exploded View drawing and accompanying Rabbet detail.

**9** Dry-clamp the carcase assembly (A,B,D,F) in the configuration shown on the Exploded View drawing to check the fit. For fitting the lower back panel (F) later, the back edges of the shelves (B) must be recessed ¼" from the back edge of the end panels (A).

**10** Measure the rabbeted opening for back panel (G), and cut it to size from ¼" oak plywood.

**11** Drill countersunk mounting holes through the upper and lower backs (D, F) and into the back edge of the end panels (A). Remove the clamps.

*Continued*

**12** Glue and clamp the carcase together, checking for square. Drive the screws now. They eliminate the need for a couple of clamps and help hold the assembly square while the glue dries.

## Now, let's construct the front assembly

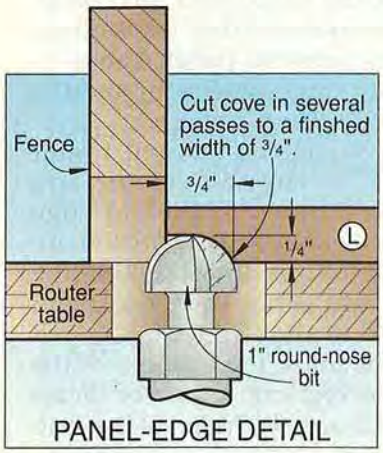
**1** Cut the face-frame stiles (H), rails (I, J, K), and panel (L) to the sizes listed in the Bill of Materials. Note that the raised panel (L) is cut from ½"-thick stock. Dry-clamp the face frame together, and check that it fits properly against the front of the cabinet.

**2** Using the Front Stile drawing on the *previous* page for reference, mark dowel-hole alignment marks on both stiles (H) and rails (I, J, and K.) Remove the clamps. Using a doweling jig, drill ⅜" holes 13⁄16" deep where marked.

**3** Mark the locations of the stopped groove on the inside edge of each stile where dimensioned on the Front Stile drawing. The grooves house the ends of the raised panel (L) later.

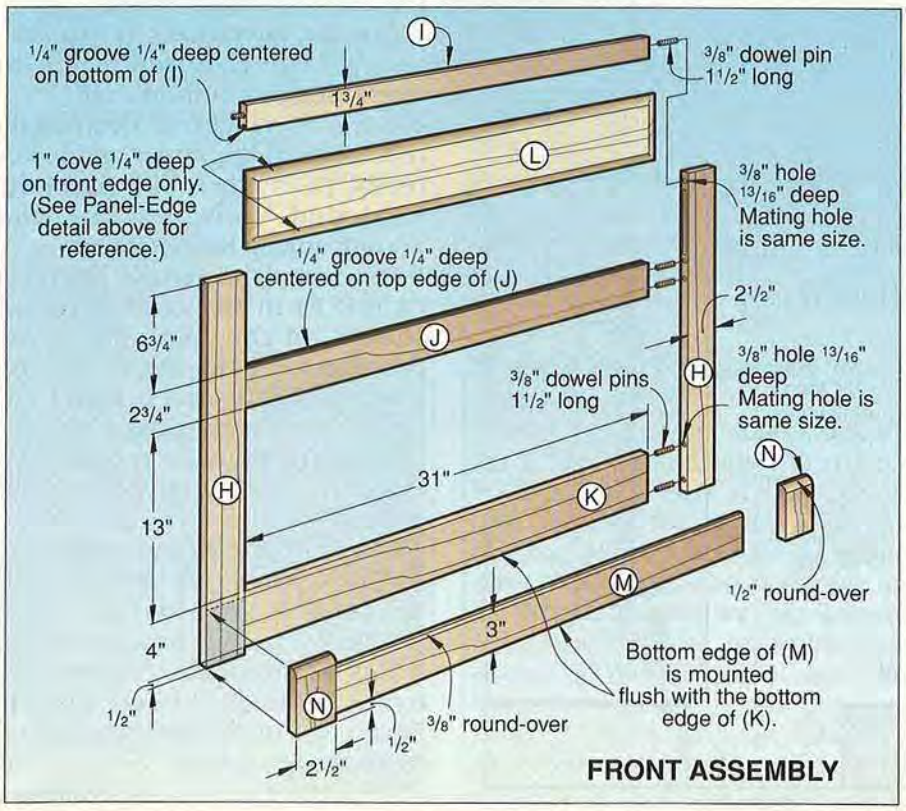
**4** Fit your table-mounted router with a ¼" straight bit and a fence. Rout a ¼" groove ¼" deep centered along the inside face of each stile (H) where marked in the previous step. See the photo *below left* for reference. (We test-routed scrap stock first to verify start and

*Continued*



PANEL-EDGE DETAIL

**Using a fence to center the straight bit to the stock, rout a ¼" groove ¼" deep along the inside face of each stile (H) to house the top panel (L).**



FRONT ASSEMBLY

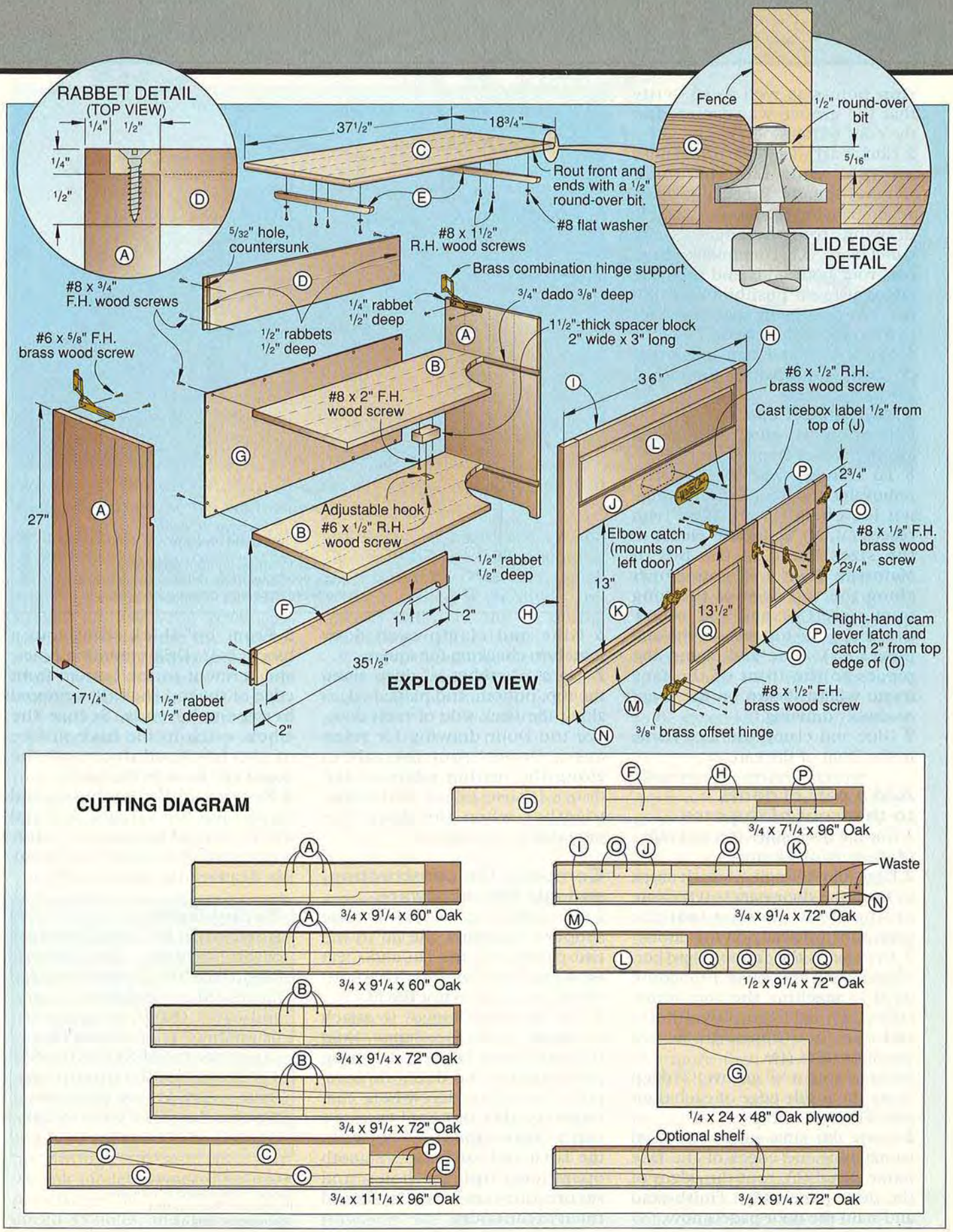
**Bill of Materials**

| Part | Finished Size T | W | L | Matl. | Qty. |
|---|---|---|---|---|---|
| BASIC CARCASE | | | | | |
| A* end panels | ¾" | 17¼" | 27" | EO | 2 |
| B* shelves | ¾" | 17" | 35¼" | EO | 2 |
| C* lid | ¾" | 18¾" | 37½" | EO | 1 |
| D* upper back | ¾" | 7" | 35½" | EO | 1 |
| E cleats | ¾" | 1" | 15¾" | O | 2 |
| F lower back | ¾" | 4¼" | 35½" | O | 1 |
| G middle back panel | ¼" | 15¾" | 35½" | OP | 1 |
| FRONT ASSEMBLY | | | | | |
| H stiles | ¾" | 2½" | 27" | O | 2 |
| I top rail | ¾" | 1¾" | 31" | O | 1 |
| J middle rail | ¾" | 2¾" | 31" | O | 1 |
| K bottom rail | ¾" | 4" | 31" | O | 1 |
| L panel | ½" | 5 7⁄16" | 31 7⁄16" | O | 1 |
| M trim | ½" | 3" | 31" | O | 1 |
| N ends | ¾" | 2½" | 4" | O | 2 |
| DOORS | | | | | |
| O stiles | ¾" | 2¾" | 13½" | O | 4 |
| P rails | ¾" | 2¾" | 10¼" | O | 4 |
| Q panels | ½" | 10 11⁄16" | 8 7⁄16" | EO | 2 |

*Initially cut parts marked with an * oversized. Then, trim each to finished size according to the how-to instructions.

**Materials Key:** EO–edge-joined oak, OP–oak plywood, O–oak.

**Supplies:** #6×½" flathead wood screws, #8×¾" flathead wood screws, #8×1½" roundhead wood screws and four #8 flat washers, #8×2" flathead wood screws, ⅜" dowel pins 1½" long, stain, clear finish.


RABBET DETAIL
(TOP VIEW)
1/4"
1/2"
1/4"
1/2"
D
A
37 1/2"
18 3/4"
C
E
Rout front and ends with a 1/2" round-over bit.
#8 flat washer
#8 x 1 1/2" R.H. wood screws
5/32" hole, countersunk
D
#8 x 3/4" F.H. wood screws
Brass combination hinge support
3/4" dado 3/8" deep
1/4" rabbet 1/2" deep
1/2" rabbets 1/2" deep
A
1 1/2"-thick spacer block 2" wide x 3" long
#6 x 5/8" F.H. brass wood screw
B
#8 x 2" F.H. wood screw
G
Adjustable hook
#6 x 1/2" R.H. wood screw
B
1/2" rabbet 1/2" deep
F
1"
2"
35 1/2"
2"
27"
A
17 1/4"
1/2" rabbet 1/2" deep
EXPLOSIVE VIEW
H
I
36"
#6 x 1/2" R.H. brass wood screw
Cast icebox label 1/2" from top of (J)
L
P
2 3/4"
O
J
Elbow catch (mounts on left door)
#8 x 1/2" F.H. brass wood screw
2 3/4"
13"
K
13 1/2"
Q
P
Right-hand cam lever latch and catch 2" from top edge of (O)
O
M
#8 x 1/2" F.H. brass wood screw
N
3/8" brass offset hinge
Fence
1/2" round-over bit
5/16"
C
LID EDGE DETAIL
CUTTING DIAGRAM
F
H
P
D
3/4 x 7 1/4 x 96" Oak
A
3/4 x 9 1/4 x 60" Oak
A
3/4 x 9 1/4 x 60" Oak
B
3/4 x 9 1/4 x 72" Oak
B
3/4 x 9 1/4 x 72" Oak
C
C
C
C
P
E
3/4 x 11 1/4 x 96" Oak
I
O
J
O
K
Waste
N
3/4 x 9 1/4 x 72" Oak
M
L
Q
Q
Q
Q
1/2 x 9 1/4 x 72" Oak
G
1/4 x 24 x 48" Oak plywood
Optional shelf
3/4 x 9 1/4 x 72" Oak

stop points as well as to verify that the groove was centered in the edge of the stock.)

**5** Chuck a 1"-diameter round-nose bit into your table-mounted router. Using the Panel Edge detail accompanying the Front Assembly drawing, rout the edges of the panel blank (L). To minimize chip-out, rout both ends and then the edges using a pushblock. You'll need to do this in several passes to form the wide recess.

**6** Finish-sand and stain the panel now (we used Bartley Fruitwood gel stain).

**7** Using dowel pins (those with glue grooves), glue, dowel, and clamp the face frame together.

**8** To simulate the front of the removable tray found on the original ice chests, we added trim pieces (M, N). Cut these pieces to the sizes listed in the Bill of Materials. Rout a ⅜" round-over along the top *edge* of the long front piece (M), and a ½" round-over along the top *ends* of the end pieces (N). Glue and clamp the pieces to the front of the face frame where shown on the Front Assembly drawing.

**9** Glue and clamp the face frame to the front of the carcase.

## Add a pair of doors to the front of the case

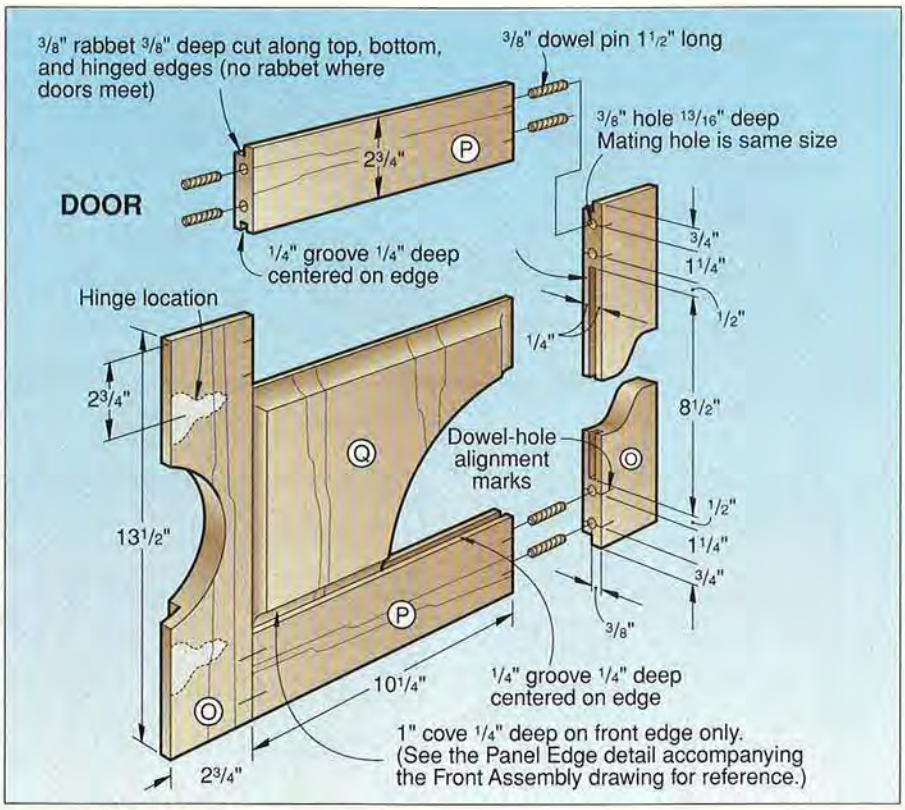
**1** Cut the door stiles (O) and rails (P) from ¾"-thick stock.

**2** Edge-join enough ½"-thick stock to form the door panels (Q). Note on the Door drawing that the grain runs vertically on the doors.

**3** Dry-clamp the frames together. Then, using the same procedure used to machine the face frame stiles (H), drill the dowel holes and rout the stopped grooves in the door stiles (O).

**4** Cut or rout a ¼" groove ¼" deep along the inside edge of each door rail (P).

**5** Using the same procedure used to machine the edges of the face frame panel (L), rout the edges of the door panels (Q). Finish-sand and stain the door panels now.




**6** Glue and clamp each door together, checking for square.

**7** Cut a ⅜" rabbet ⅜" deep along the top, bottom, and hinged edges along the back side of each door. See the Door drawing for reference. *Do not* rout the rabbet along the mating edges of the doors (those edges that come together when the doors are mounted to the cabinet).

## Complete the construction, and add the hardware

**1** Use a pair of combination hinge supports to mount the lid to the end panels. See the Lid and Cleat drawing for mounting locations. Open and close to test the fit.

**2** Use the offset hinges to attach the doors to the face frame. Hold the cam lever latch and mating catch against the doors to accurately locate the screw-hole centerpoints. (For our hardware, we had to leave about ⅛" between the latch and catch for a smooth operation.) Drill the holes, and secure the cam lever latch and catch to the doors.

**3** From 1½"-thick stock, cut a block 2×3". Drill mounting holes, and screw it to the bottom front edge of the top shelf (B) centered between the ends. Secure the elbow catch to the back surface of the left-hand door and the adjustable hook to the block.

**4** Remove all the hardware, and finish-sand the carcase, lid, and doors. Stain the pieces. Later, apply several coats of a clear finish. Reattach the hardware.

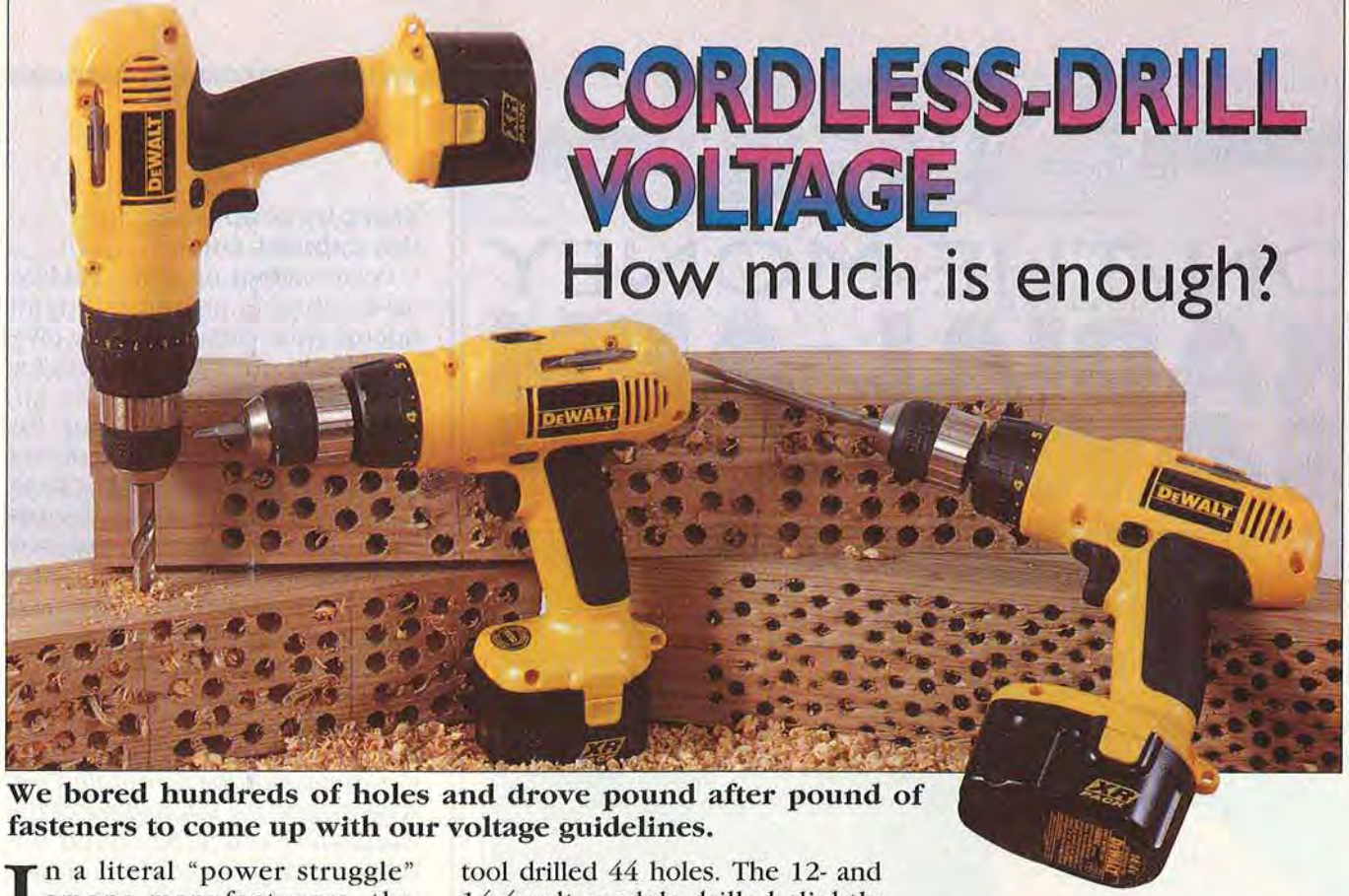
### Buying Guide

**Hardware kit.** Brass elbow catch (#S1386), cast icebox label (#SM10), 2 pair of offset hinges (ST23), right-hand latch and catch (S1901A), and one pair of brass combination hinge supports (#S3681). Kit no. S3921PPD, $37.95 ppd. Van Dyke's, 4th Ave. & 6th Street, Woonsocket, SD 57385. Or call 800/843-3320 to order.

Written by Marlen Kemmet
Project Design: James R. Downing
Illustrations: Kim Downing
Photographs: King Au

# CORDLESS-DRILL VOLTAGE

## How much is enough?




**We bored hundreds of holes and drove pound after pound of fasteners to come up with our voltage guidelines.**

In a literal "power struggle" among manufacturers, the voltage of cordless drills has gone in one direction recently: straight up. Just a few years ago, 12-volt models were the musclemen of battery-powered tools. Then, Freud debuted a 13.2-volt cordless drill, and in 1994 a 14.4-volt DeWalt model appeared.

To find out how much power a woodworker really needs, we put three similar drills of different voltages, but of the same brand, through a variety of demanding tasks. The DeWalt models in our trials were the DW962K-2 (9.6 volts with two batteries, about $180), DW972K-2 (12 volts with two batteries, $190), and DW991K (14.4 volts with one battery, $200). You can also save about $20 on the 9.6- and 12-volt models by buying versions with just one battery pack.

### Here's what happened in our side-by-side trials

In our first test, we chucked a new ½" twist bit into each drill and bored as many holes as possible through a treated 4×4. The 9.6-volt model averaged 28 holes per charge, the 12-volt unit produced 35 holes, and the 14.4-volt tool drilled 44 holes. The 12- and 14.4-volt models drilled slightly faster than the 9.6-volt unit, but all of them stalled if we didn't frequently withdraw the bit during the drilling to clear debris.

We also tried the drills with some of the most demanding bits in our shop, including a 1½" spade bit, a 1" wood-auger bit, and a 2" Forstner bit. All of the drills handled these bits in 1½" pine, but for harder or thicker material we suggest you use a ½" electric drill.

Next, we drove 3" drywall screws and ¼×3" lag screws into our treated 4×4. The 9.6-volt drill averaged 170 drywall screws and 30 lag screws. The 12-volt model buried 220 drywall screws and 42 lag screws. And the 14.4-volt model averaged 265 drywall screws and 49 lag screws.

Black & Decker, maker of DeWalt tools, lists the power of these units, expressed in inch/pounds of torque, as 175, 200, and 235 for the 9.6-, 12-, and 14.4-volt models respectively. Although we could feel the differences in torque in our wrists, all of the drills had sufficient power for most any workshop task. However, we did find that with the higher-powered units we could sometimes get away with drilling big holes or driving large fasteners in high gear. (All of the machines have a low- and high-speed range.) All in all, the main advantage of extra voltage seems to be extended run time, more so than extra torque.

### Our recommendations

A 9.6-volt machine will handle 99 percent of the drilling and driving tasks a woodworker will likely run into. If you do construction tasks that require you to drive long lag screws, or several hundred deck or drywall screws, you'll appreciate the extra power and run time of a higher-voltage machine.

Among the tested DeWalt drills, we recommend buying the 12-volt machine with *two* battery packs for two reasons. First, it costs only $10 more than the 9.6-volt, two-battery kit, and it clearly delivers more torque and run time. And, the 12-volt kit costs $10 less than the 14.4-volt model that comes with *one* battery. In our trials, the extra battery proved itself more valuable than the additional 2.4 volts of the larger unit.

Photography: John Hetherington Photography

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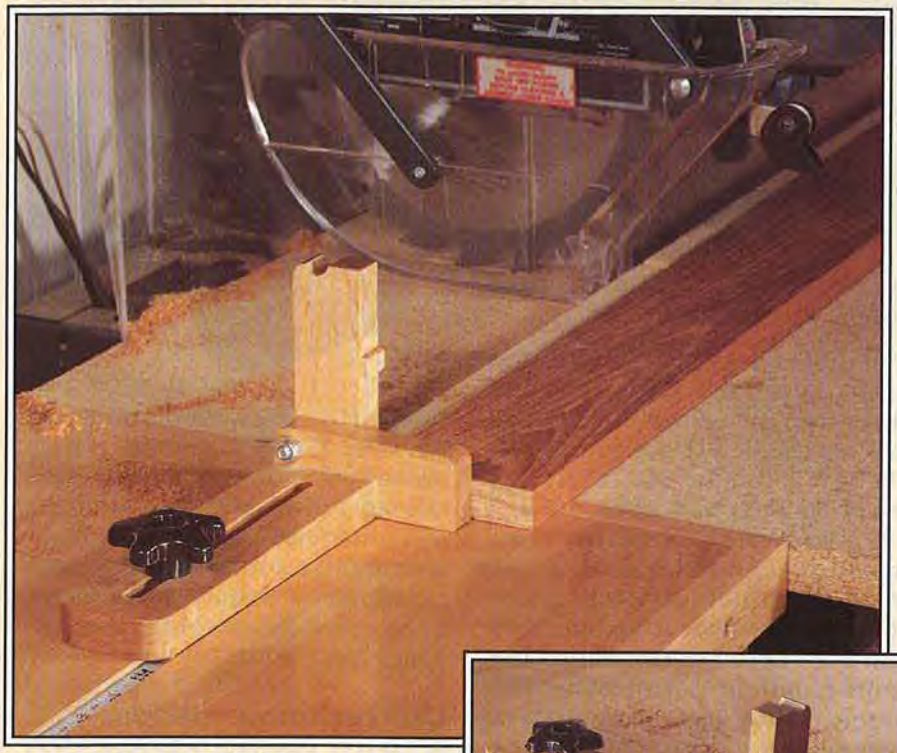
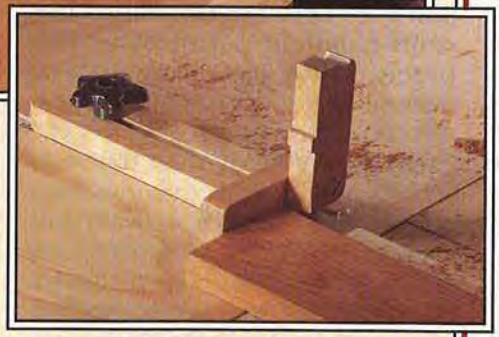
# ON-THE-MONEY RADIAL-ARM SAW STOP





**Looking for a way to expand your radial-arm saw's cutoff capability and create more work surface? If so, here's how we set up our radial-arm saw center in IDEA SHOP 2. We positioned two 4'-wide base cabinets to the left of the saw, added a top, and designed a sliding stop to fit into a groove in the top. The stop allows you to eliminate the need for a fence, creating more usable, unobstructed work surface.**

**Buying Guide**

**Tape and knob.** Self-stick metal tape measure, reads right to left, 12' long, catalog no. 100-045, $7.95. Star knob, 2¼" dia. with 1/4-20 threaded insert, catalog no. 862-214, $1.20. Woodworker's Supply Inc., 1108 North Glenn Road, Casper, WY, 82601 or call 800/645-9292.

Print this article

## Start by preparing the cabinet top

**1** Position two or more kitchen base cabinets on the left-hand side of your radial-arm saw. (We added two 48" base cabinets for an 8'-long storage unit.)

**2** To form the 1½"-thick top for the base cabinets, cut two pieces of ¾" plywood (we used birch) to size. With the edges and ends flush, glue and clamp the two plywood pieces together face-to-face. Later, band the edges with solid stock to hide the plies.

**3** Temporarily position the laminated top on the base cabinets. You'll probably need to add subbases to raise your cabinets *so the top surface of the laminated top is flush with the top surface of the radial-arm saw table*. Build the subbases and secure them to the bottom of the cabinets. Mark the location and cut or rout a ½" groove 5/16" deep along the length of your cabinet top, flush with the front of the radial-arm saw fence where shown on the drawing titled Positioning the Tape.

**4** Mark a centerline parallel to the groove and ⅝" behind it where shown on the drawing. Drill 5/16" holes 6" apart down the length of the marked centerline. Using epoxy, adhere a ¼" T-nut into each hole on the bottom side of the cabinet top. A few drops of epoxy is critical to keep the T-nuts from falling out of the holes over time. Be careful not to get any epoxy in the threaded part of the T-nut.

**5** Fit a ⅛×½×96" length of aluminum bar stock into the groove. Position one end of the bar flush with the left-hand end of the cabinet top. Trim the other end (that nearest the saw blade) ¼" from the right-hand end of the laminated top to allow for adjustment. See Positioning the Tape drawing for reference.

**6** Cut a 3/16" slot ½" long into the end of the aluminum stock where shown on the Adjustment detail.

(We drilled two 3/16" holes and scrollsawed the waste between the holes to form the slot.)

**7** Fit the aluminum bar into the groove. Now, drill a 1/8" pilot hole through the center of the slot in the aluminum bar and into the laminated top.

**8** Position the laminated top on the cabinets. Then, secure the laminated top to the cabinet tops.

**9** Before removing the back of the self-adhesive tape, hold one end (the 0" end) of the tape against the left edge of the saw blade. Mark the point where the tape meets the end of the aluminum bar stock, and cut the tape in two here. Now, remove the backing and adhere the tape to the aluminum bar stock. See the Buying Guide for our self-adhesive measuring tape source.

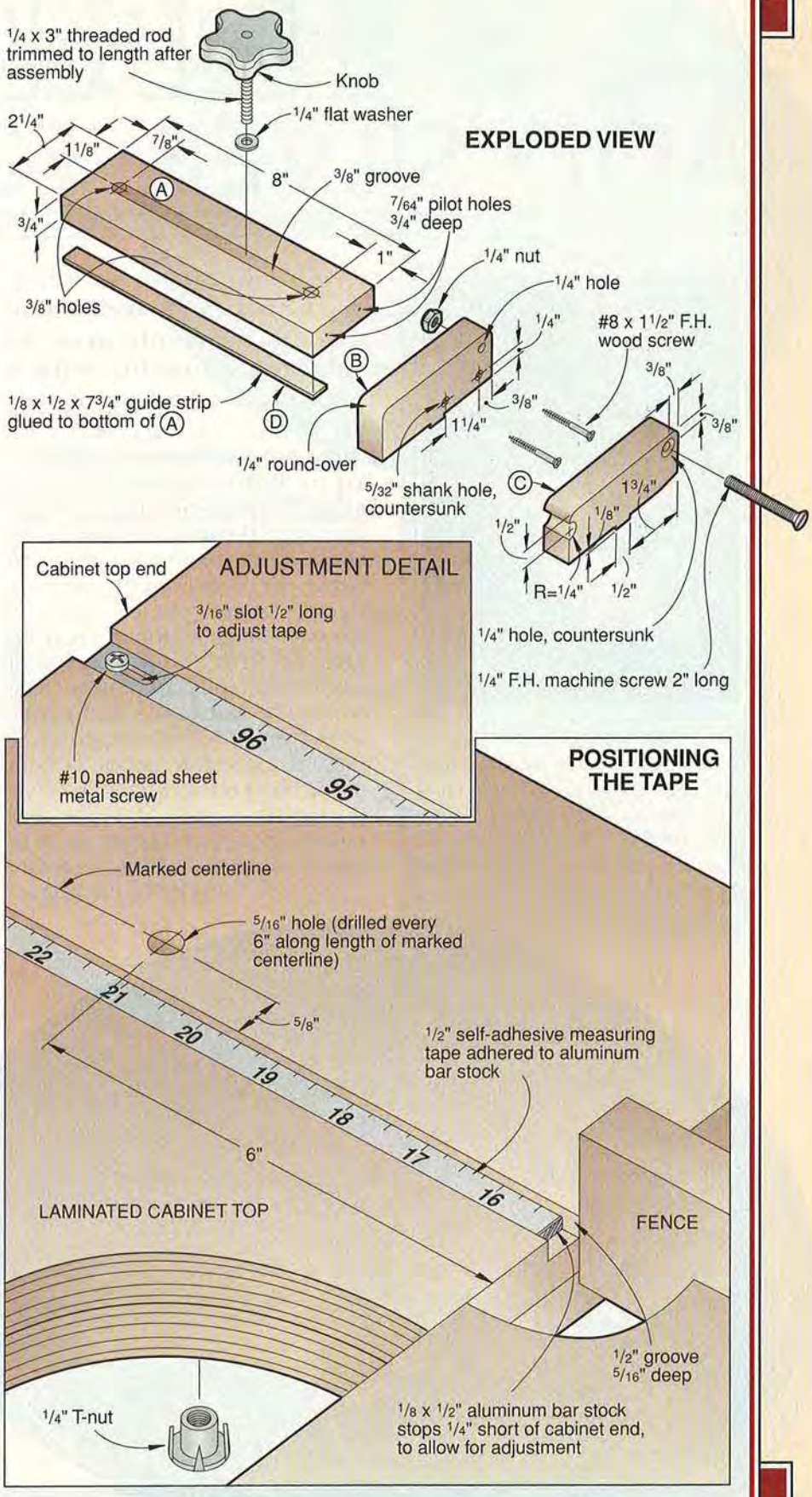
## And, now for the stop

**1** From 3/4"-thick maple, cut the stop body (A) to size. See the full-sized patterns for parts A, B, and C on the *WOOD PATTERNS™* insert in the center of the magazine. Mark the slot location, and drill a 3/8" hole at each end of the slot. Draw a pair of lines to connect the outside edges of the holes, and scrollsaw along the lines to remove the waste and form the slot.

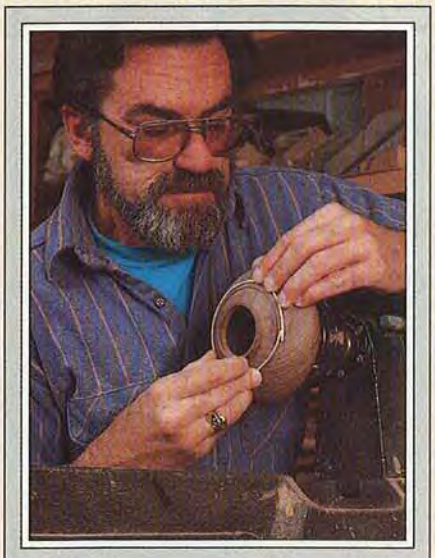
**2** Transfer the full-sized patterns for the support (B) and the flip-up stop end (C) to 3/4" stock, and cut them to shape. Cut part D to size. Drill the holes and assemble the pieces in the configuration shown on the Exploded View drawing.

**3** Epoxy a 3" length of 1/4" threaded rod into the threaded insert in a plastic knob (see the Buying Guide for our source). Trim the opposite end of the rod so it reaches through part A, through the cabinet top and into the 1/4" T-nut. The length of the threaded rod will vary with the thickness of your cabinet top.

*Continued on page 93*



# A STERLING ADD SILVER TO YOUR



Frank Nabrotzky's turnings really sparkle. That's because the Salt Lake City woodturner inlays them with silver. When we saw how straightforward Frank's process is, we knew you would want to learn about it.

**Here's a technique we think you turners will take a shine to. It's a simple way to brighten a turning with a dramatic touch of silver.**

## Turn a bowl for your silver

To try Frank's silver inlay technique yourself, first turn a vessel to receive the inlay. A closed form about 6" in diameter, similar to either one shown on the *opposite page*, is a good choice. The precious-metal inlay looks great on urns, too. (For a wide selection of suitable shapes, check out the Southwest-style bowls in the June 1994 issue of *WOOD®* magazine.)

Mount a faceplate on the bottom of the bowl blank. Attach the faceplate with screws, driven either directly into your turning stock or into a wooden auxiliary faceplate glued to the blank.

Round the blank and establish the top of the rim and the bottom of the base with parting-tool cuts. Turn the blank to the major diameter and form the profile with a ⅜" or ½" bowl gouge.

Size the turning to allow for an inlay 3-6" in diameter. Circles in this size range make nicely proportioned accents when using the 1/16" square silver wire shown.

Mark the vessel's inside depth on the shank of your bowl gouge with a piece of tape. Then, bore straight into the center of the turning with the gouge, stopping at the mark. From that starting point, clean out the inside with the bowl gouge, a round-nose scraper, or a boring-bar tool, depending on the vessel design.

Turn the outside of the bowl to final shape, leaving the wall about ¼" thick. Sand with progressively finer grits to 220, but do not apply finish yet. Don't part it off, either.

## Make that bowl sparkle

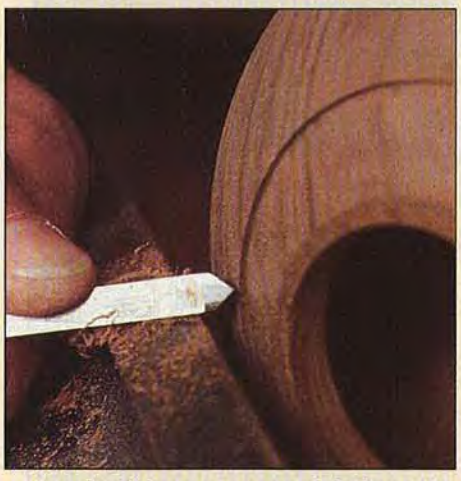
With the vessel still mounted on the lathe, begin the inlay process. First, determine the location for the silver band. Frank avoids placing it at the exact middle of the turning. Likewise, he doesn't divide any part or surface exactly in two with it. In the example shown, he selected a point for the accent about three-fourths of the way from the major diameter to the neck.

Cut the inlay groove with a parting tool the same thickness as your silver wire—1/16" here. Frank uses a parting tool ground thinner at the

Print this article

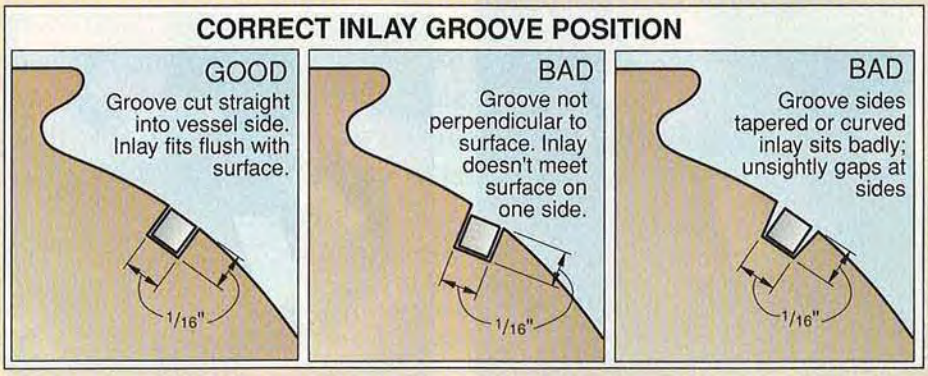
# IDEA! TURNINGS

This parting tool, ground to the thickness of the inlay wire, cuts the groove.



Cut the inlay groove straight into the vessel's side. A snug-fitting inlay looks best, so test-fit the wire as you work.

This silver-wire inlay isn't the only way Frank adds precious metal to turnings. He has accented a natural opening with a stone-set accent on the vessel shown *opposite page bottom*. A necklace chain makes a patterned inlay, *bottom*. To make this type, cut a groove as for the wire inlay, glue the chain in with the top just above the surface, then cut lightly into the chain with the final scraper cut.


CORRECT INLAY GROOVE POSITION
GOOD
Groove cut straight into vessel side. Inlay fits flush with surface.
1/16"
BAD
Groove not perpendicular to surface. Inlay doesn't meet surface on one side.
1/16"
BAD
Groove sides tapered or curved inlay sits badly; unsightly gaps at sides
1/16"

tip, *above top*. You also could grind a suitable tool from an Allen wrench or screwdriver.

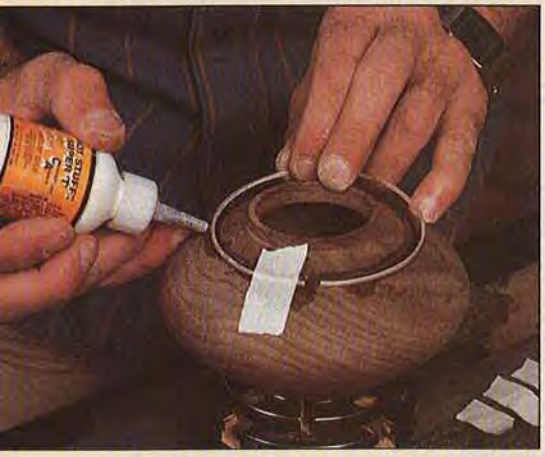
For a snug, neat-fitting inlay, take care to form straight sides in the groove, perpendicular to the bowl's surface. (See the Inlay Groove drawing, *above right*.) The groove's depth equals the thickness of the inlay material—1/16" for our square wire. Check the wire's fit as you work.

After sizing the groove, cut the silver wire to length. To do this, lay it into the groove and mark the overlapping end with a scriber or knife, shown *next page top left*. Allow some extra length

*Continued*

# A STERLING IDEA!

Lay the silver wire into the groove, then mark the length. Cut the end square for a close-fitting joint.



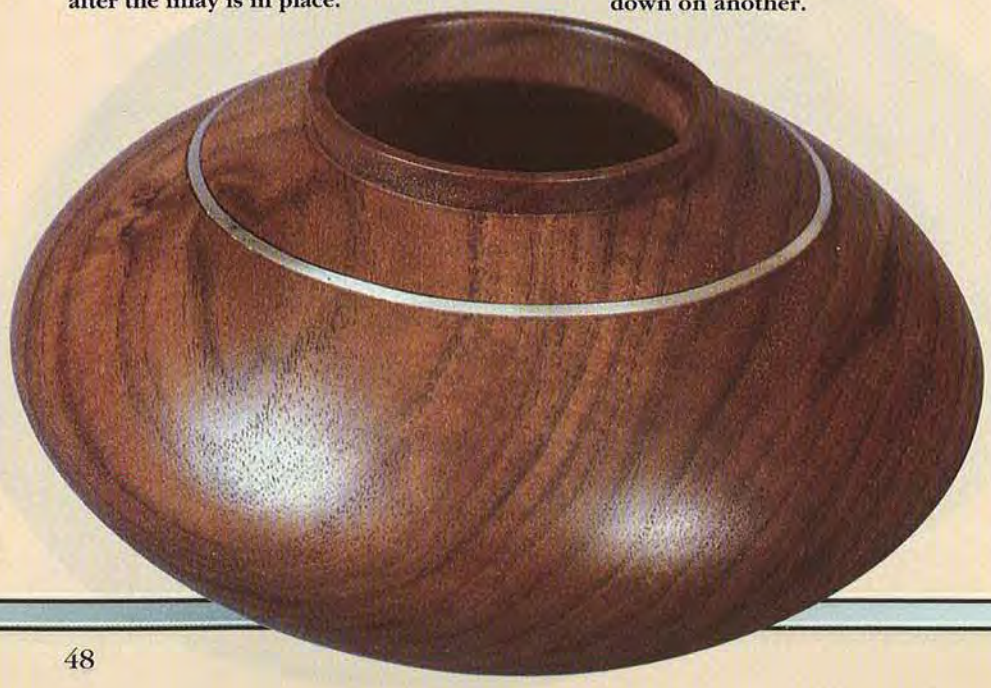
Gap-filling cyanoacrylate (CA) adhesive in the bottom of the groove holds the inlay in place. Apply CA along the sides after the inlay is in place.

when cutting with ordinary wire cutters. They'll snip through the silver easily, but will leave a pointed end. File or sand the end square to the mark for a neat-looking joint. You can trim the wire right to the mark with flush-cutting pliers.

Lay the wire into the groove once more to test the fit. Then, dismount the turning from the lathe, and glue the silver into place.

Glue one end of the wire into the groove with gap-filling cyanoacrylate (CA) adhesive. Secure that end with tape, then work around the bowl, putting CA in the bottom of the groove and pressing the inlay into it, as shown *left*. Tape it at several points until the glue cures, *below*.

Tape the silver down as you glue it into the groove. The tape prevents one side from popping up when you press down on another.



Remove the tape, remount the turning, and clean up glue residue along the inlay with a light scraper cut, shown *below*. The soft silver won't hurt your turning tool if you happen to cut into it. The metal could snag a gouge, though, so stick to the scraper for this operation.

Apply a clear finish overall, then part the bowl from the lathe. Sand and finish the bottom.

Clean up the inlay and surrounding wood with a light scraper cut. Remove as little material as possible.

## Sources for silver

Frank often uses 1/16" square silver wire for his inlays. "Use annealed silver wire, it's soft and easy to work with," Frank advises. "Custom jewelers and jewelry-supply houses dealing in standard silver are the best places to buy it," he adds. If you have trouble finding the right stuff, write to Frank for a price and availability quote. (The market price fluctuates.) Frank Nabrotzky, 1381 E. 1300 S., Salt Lake City, Utah 84105. (No telephone calls, please.)

Another source of inlay material: sterling silver necklace chains from jewelry stores or department stores. Chains create a repeating pattern when skimmed with a scraper. Different styles of chains will give varying effects. Be sure, though, to buy a solid silver chain, not a silver-plated one.

Project Design: Frank Nabrotzky
Photographs: Gary Zeff
Illustrations: Kim Downing

# WOOD INDEX

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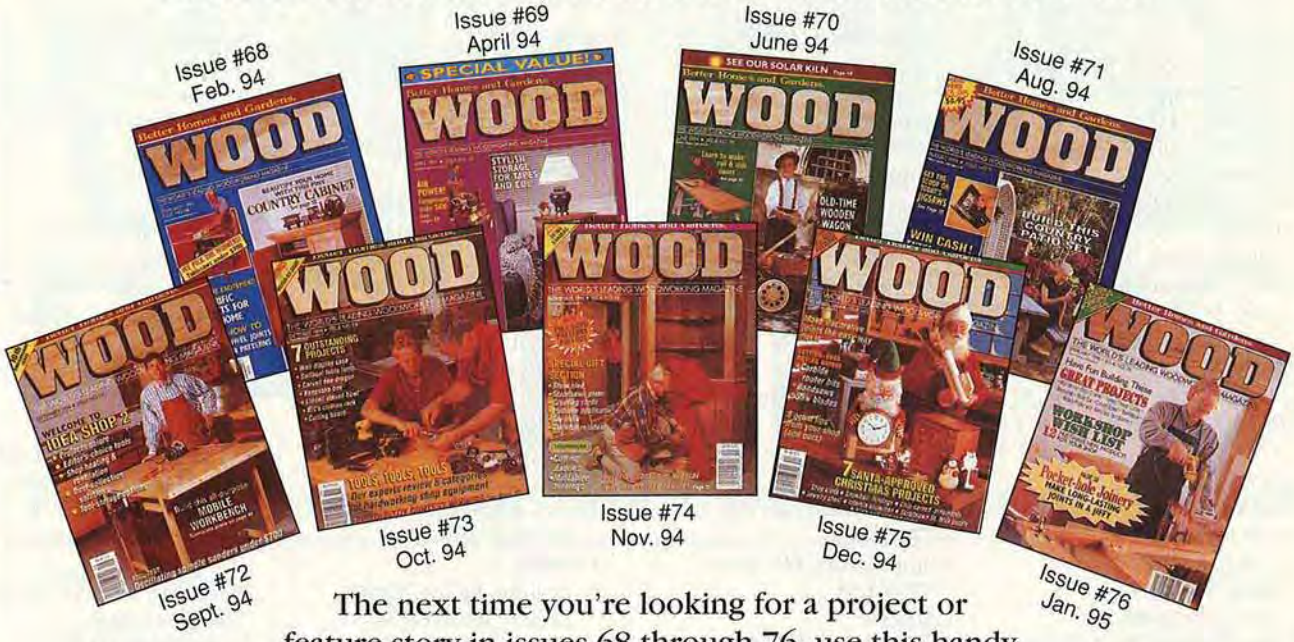


The next time you're looking for a project or feature story in issues 68 through 76, use this handy reference to help you find it fast. We kept it simple. For instance, when searching alphabetically for the story on bowl blanks, you'll find "Bowls: blanks for, 76:48." To locate the story, go to issue 76, page 48.

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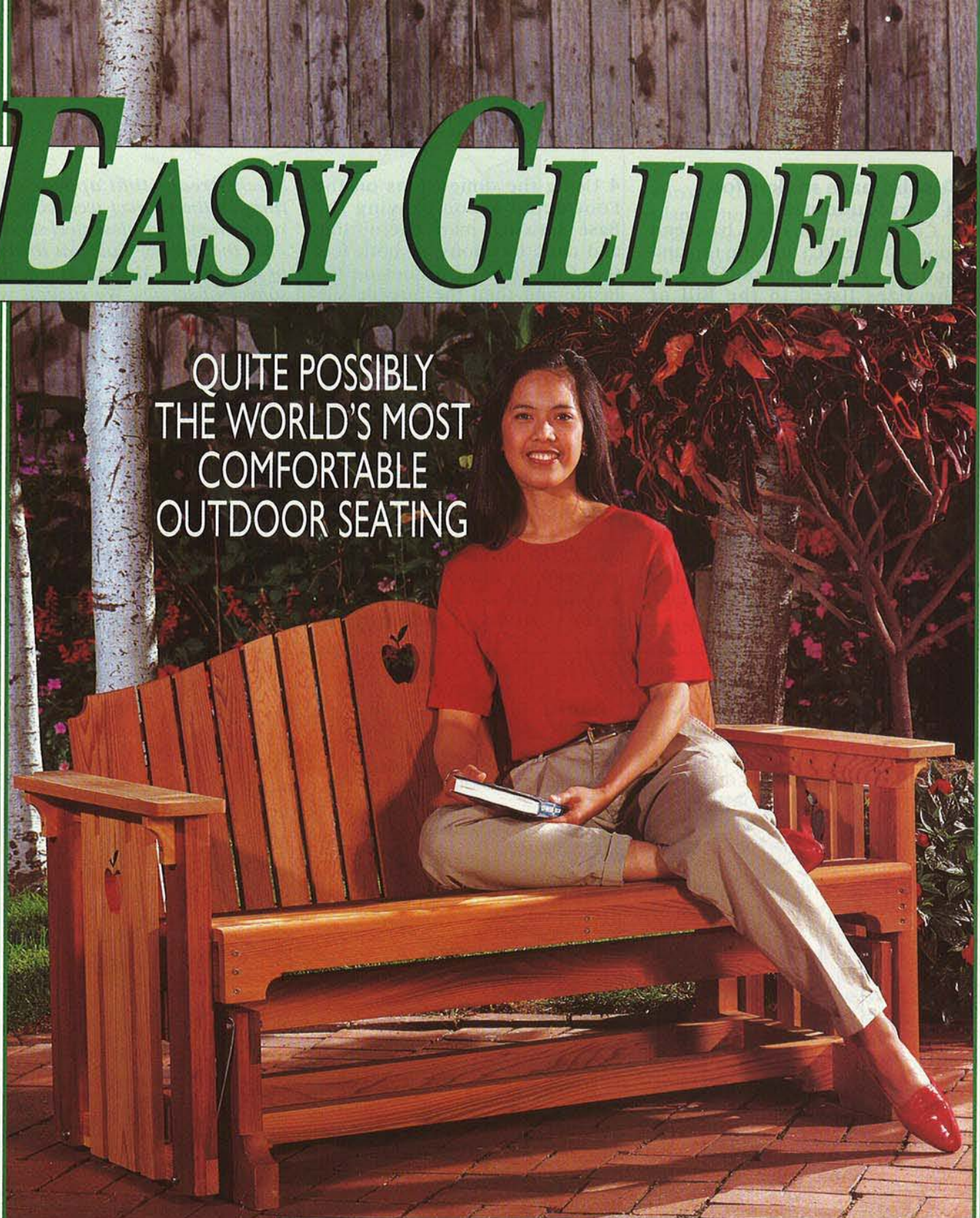
# EASY GLIDER



## QUITE POSSIBLY THE WORLD'S MOST COMFORTABLE OUTDOOR SEATING

**There's nothing quite as relaxing as sitting on your front porch or patio at the end of a hard day. That's especially true now that you can settle into this graceful glider. Built of cedar, our project requires just strap iron and inexpensive bronze bushings for the smooth-action swing arms that support the seat. Start now, and you'll be enjoying those beautiful sunsets in no time at all.**

*Continued*

# EASY GLIDER

Print this article

## A solid base makes for a firm foundation

**1** Cut the uprights (A), base end tops (B), feet (C) and the top and bottom crossmembers (D, E) to the sizes listed in the Bill of Materials (we used cedar).

**2** Mark the locations, and cut half-lap joints across both ends of the uprights (A) and base end tops (B). See the Base drawing for reference. (We did this on our tablesaw using a dado blade. To support the pieces cutting, we attached a wooden extension and stop to our miter gauge. Cut scrap stock first to verify the depth of cut and location of stop.)

**3** Mark the location, and cut a 1½" dado ¾" deep centered from end-to-end in the base end top (B).

**4** Using the dimensions on the Foot detail accompanying the Base drawing, mark the outline and dado locations on both feet (C). Cut a pair of dadoes on the inside and then the outside surfaces of each foot where marked. Now, cut the feet to shape.

**5** Using the full-sized pattern on the *WOOD PATTERNS™* insert in the center of the magazine, mark the bottom edge of the lower crossmembers (E), and cut them to shape.

**6** Use a drum sander to sand the radii on parts C and E.

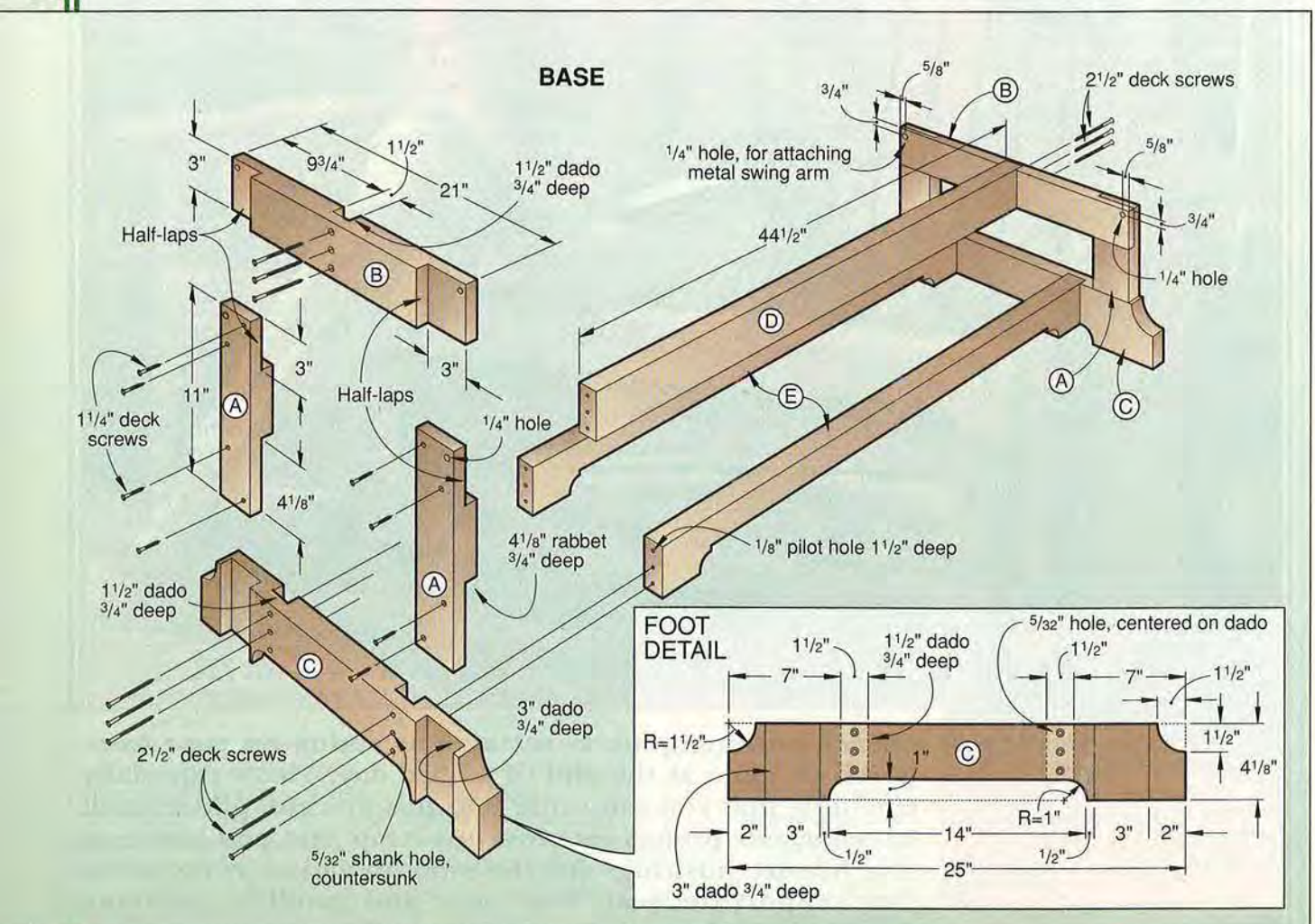
***Note:*** *The tannic acid in western red cedar is notoriously hard on galvanized and other coated screws. To avoid the unsightly black streaks that appear over time as the project weathers, we recommend stainless steel screws.*

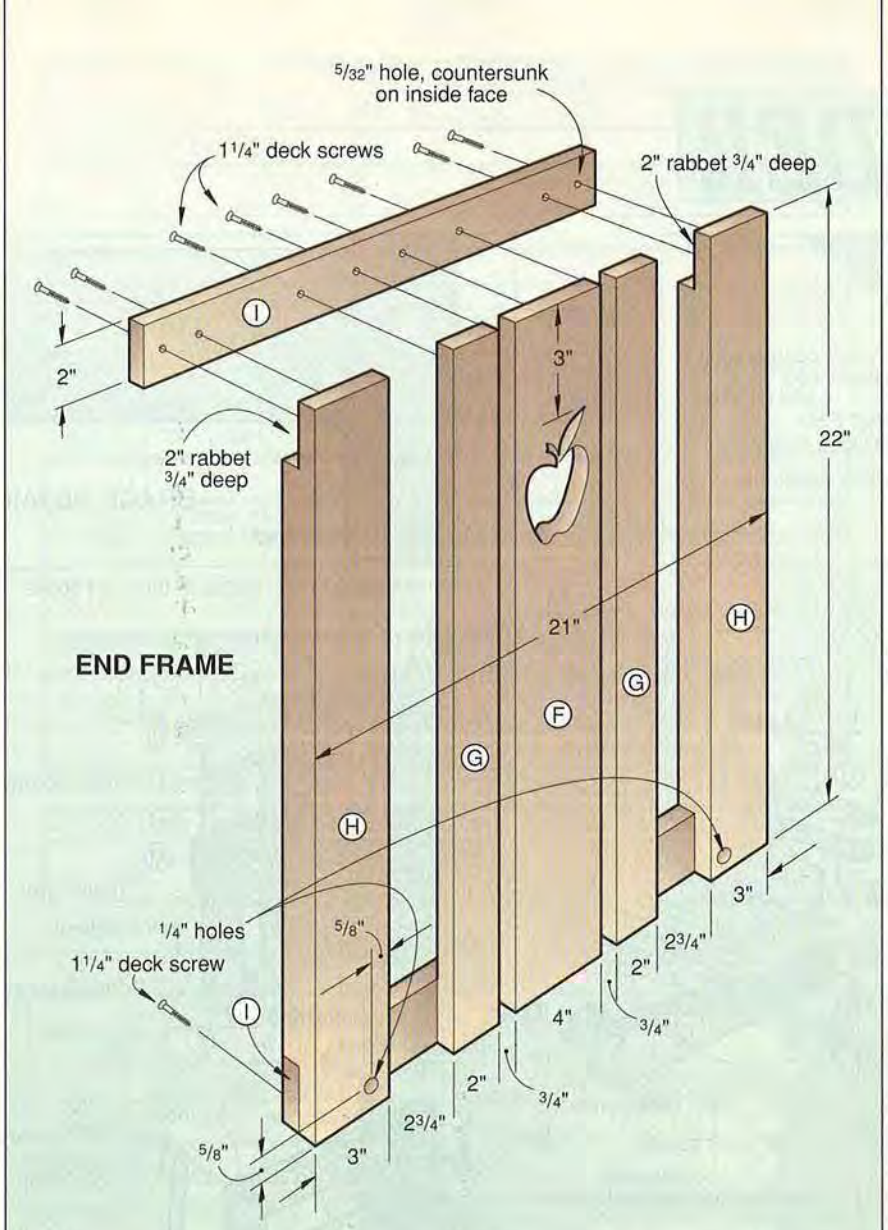
*See the Buying Guide at the end of the Bill of Materials for our source of screws. We suggest you construct your glider using a water-resistant glue so that it will stand up to the weather.*

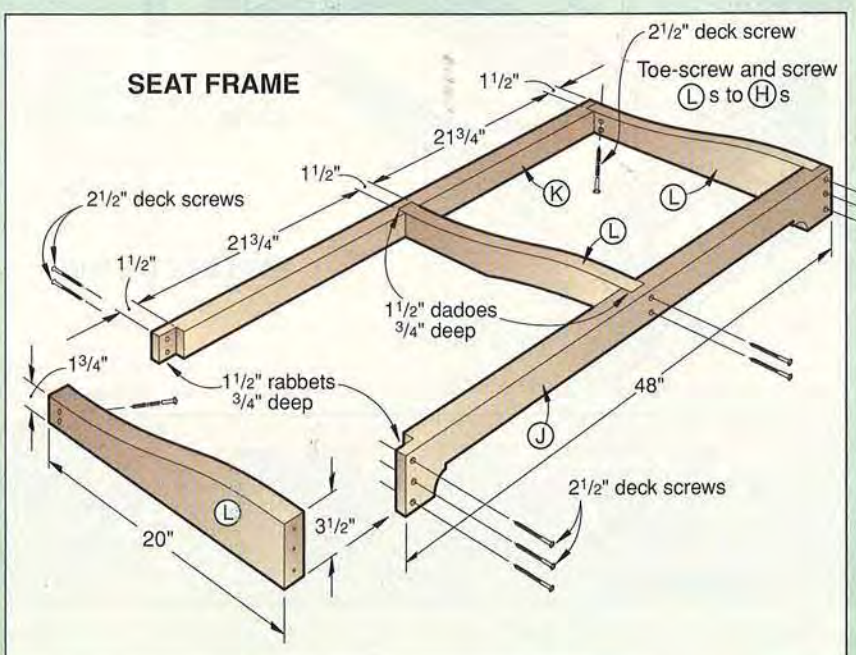
**7** Glue and screw the base ends (A, B, C) in the configuration shown on the Base drawing.

**8** To facilitate adding the metal swing arms later, mark the centerpoints on the top corners of each assembled base end where shown on the Base drawing. Using a ¼" brad-point bit mounted in your drill press, drill the holes.

**9** Drill 5⁄32" countersunk shank holes in the base ends where






shown on the Base drawing. Clamp the crossmembers (D, E) in place between the end assemblies. Glue the mating surfaces, and drive 2½" deck screws to secure the crossmembers in place. Sand the base smooth.

## The end frames come next

**1** Cut the end-frame slats (F, G, H) and rails (I) to size. Note that parts F, G, and I are cut from ¾" stock, and part H is from 1½"-thick stock.

**2** Using your tablesaw fitted with a dado blade, cut a 2"-wide rabbet ¾" deep across both ends of each outside slat (H).

**3** Transfer the full-sized apple pattern from the pattern insert to the center slats (F), 3" from the top end of each, where shown on the End Frame drawing. Drill a blade-start hole, and scrollsaw the patterns to shape.

**4** Glue and screw each end frame together in the configuration shown on the drawing.

**5** For attaching the swing arms later, mark the centerpoints near the bottom corners of each assembled end frame where shown on the End Frame drawing. Using a ¼" brad-point bit mounted in your drill press, drill the holes where marked. Sand the end frames.

## Now, construct the seat frame, and add the slats

**1** Cut the seat-frame crossmembers (J, K) and supports (L) to size.

**2** Mark the locations, and cut rabbets and dadoes in the crossmembers (J, K) where dimensioned on the Seat Frame drawing *at left*.

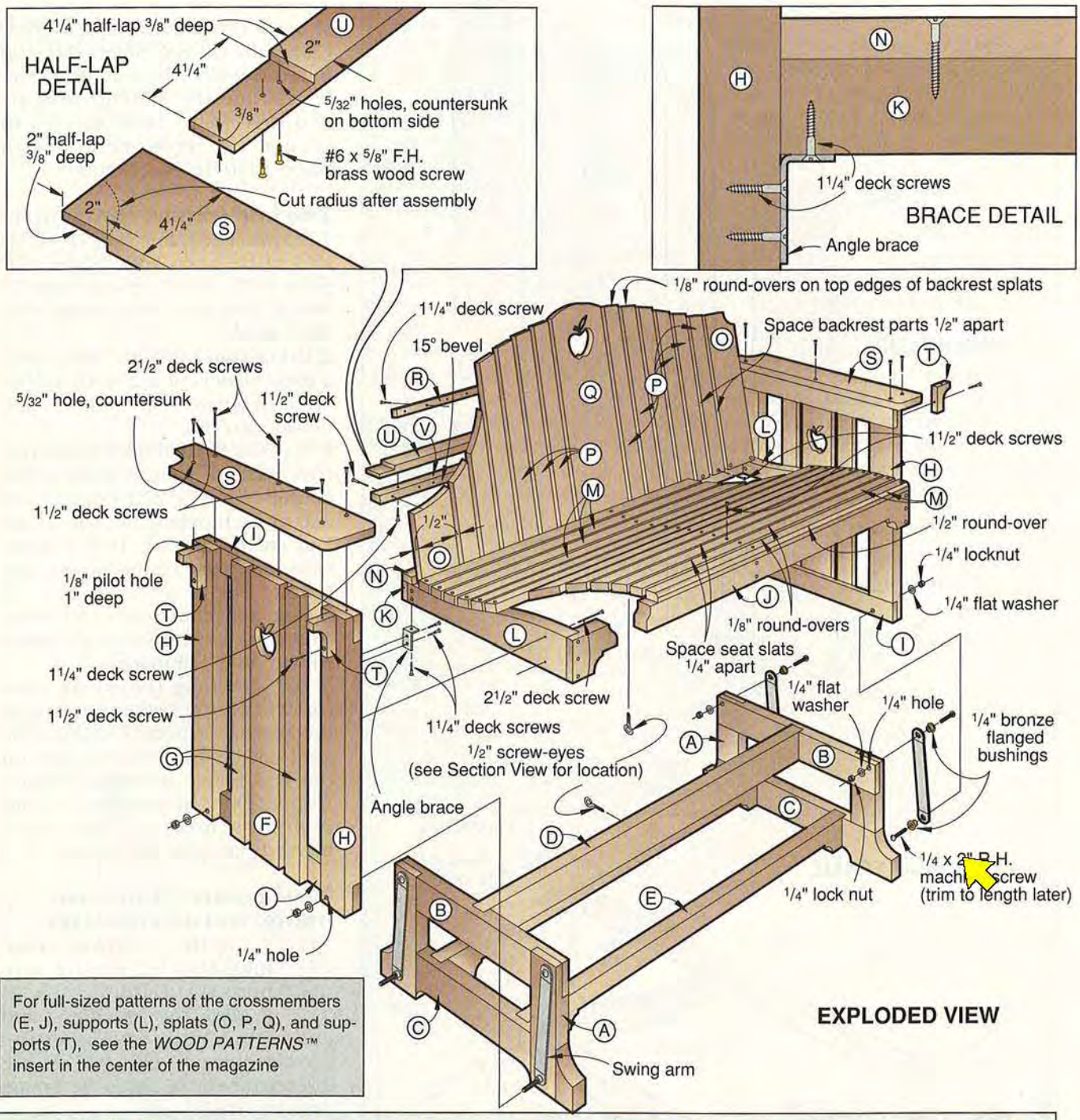
**3** Transfer the full-sized patterns from the pattern insert, and cut the bottom edge of the front crossmember (J) and supports (L) to shape. Sand the cut edges.

**4** Glue and screw the seat frame together, checking for square.

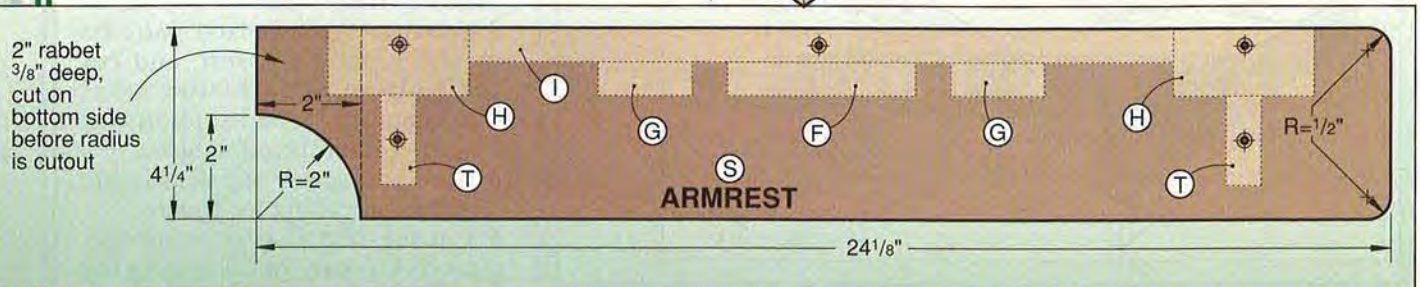
**5** Cut the seat slats (M) and rear cleat (N) to size, bevel-ripping the

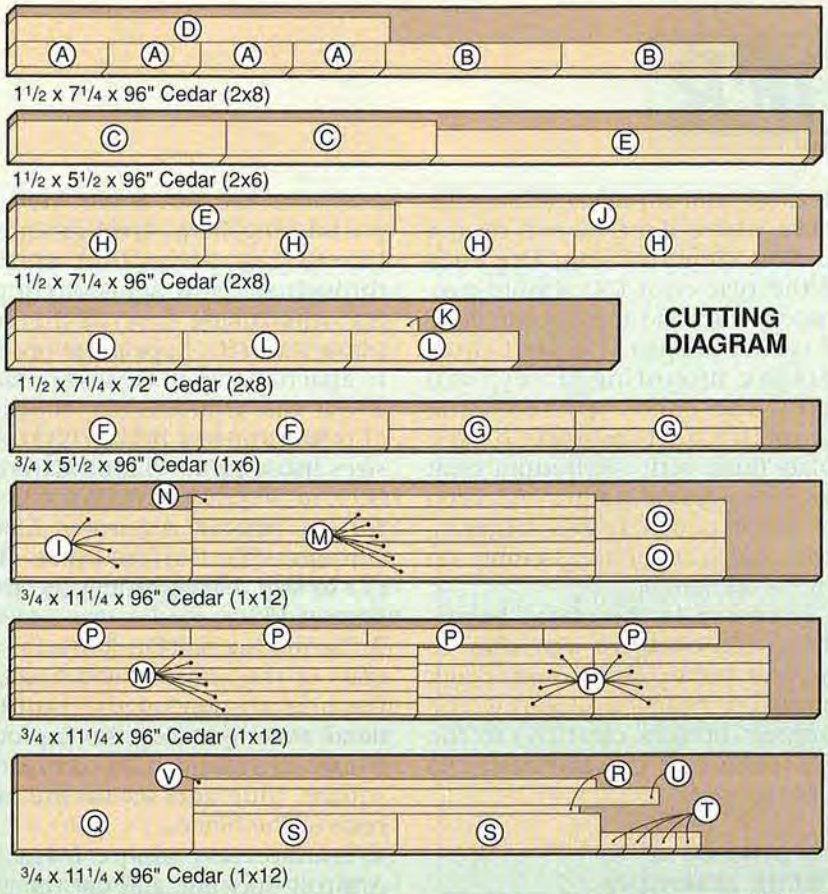
*Continued*

# EASY GLIDER




For full-sized patterns of the crossmembers (E, J), supports (L), splats (O, P, Q), and supports (T), see the *WOOD PATTERNS™* insert in the center of the magazine




D
A A A A B B
1½ x 7¼ x 96" Cedar (2x8)
C C E
1½ x 5½ x 96" Cedar (2x6)
E J
H H H H
1½ x 7¼ x 96" Cedar (2x8)
K
L L L
1½ x 7¼ x 72" Cedar (2x8)
F F G G
¾ x 5½ x 96" Cedar (1x6)
N
I M O O
¾ x 11¼ x 96" Cedar (1x12)
P P P P
M P
¾ x 11¼ x 96" Cedar (1x12)
V R U
Q S S T
¾ x 11¼ x 96" Cedar (1x12)

**CUTTING DIAGRAM**

## Bill of Materials

| Part | Finished Size T | W | L | Matl. | Qty. |
|---|---|---|---|---|---|
| **BASE** | | | | | |
| A uprights | 1½" | 3" | 11" | C | 4 |
| B frame tops | 1½" | 3" | 21" | C | 2 |
| C feet | 1½" | 4⅛" | 25" | C | 2 |
| D top crossmember | 1½" | 3" | 44½" | C | 1 |
| E bottom crossmember | 1½" | 3⅛" | 44½" | C | 2 |
| **END PANELS** | | | | | |
| F slats | ¾" | 4" | 22" | C | 2 |
| G slats | ¾" | 2" | 22" | C | 4 |
| H slats | 1½" | 3" | 22" | C | 4 |
| I rails | ¾" | 2" | 21" | C | 4 |
| **SEAT FRAME** | | | | | |
| J crossmember | 1½" | 3½" | 48" | C | 1 |
| K crossmember | 1½" | 1¾" | 48" | C | 1 |
| L supports | 1½" | 3½" | 20" | C | 3 |

| Part | Finished Size T | W | L | Matl. | Qty. |
|---|---|---|---|---|---|
| **SEAT SLATS AND CLEAT** | | | | | |
| M slats | ¾" | 1⅜" | 48" | C | 12 |
| N cleat | ¾" | 1½" | 48" | C | 1 |
| **BACKREST ASSEMBLY** | | | | | |
| O* splats | ¾" | 4½" | 16" | C | 2 |
| P* splats | ¾" | 2" | ** | C | 12 |
| Q* splat | ¾" | 7" | 21" | C | 1 |
| R top cleat | ¾" | 1" | 46" | C | 1 |
| S armrests | ¾" | 4¼" | 24⅛" | C | 2 |
| T supports | ¾" | 2" | 3" | C | 4 |
| U brace | ¾" | 2" | 55½" | C | 1 |
| V cleat | ¾" | 1" | 47" | C | 1 |

*Initially cut parts marked with an * oversized. Trim to finished size according to the instructions.

**See the patterns on the *WOOD PATTERNS*™ insert for exact lengths of splats O, P, and Q.

**Material Key:** C–cedar

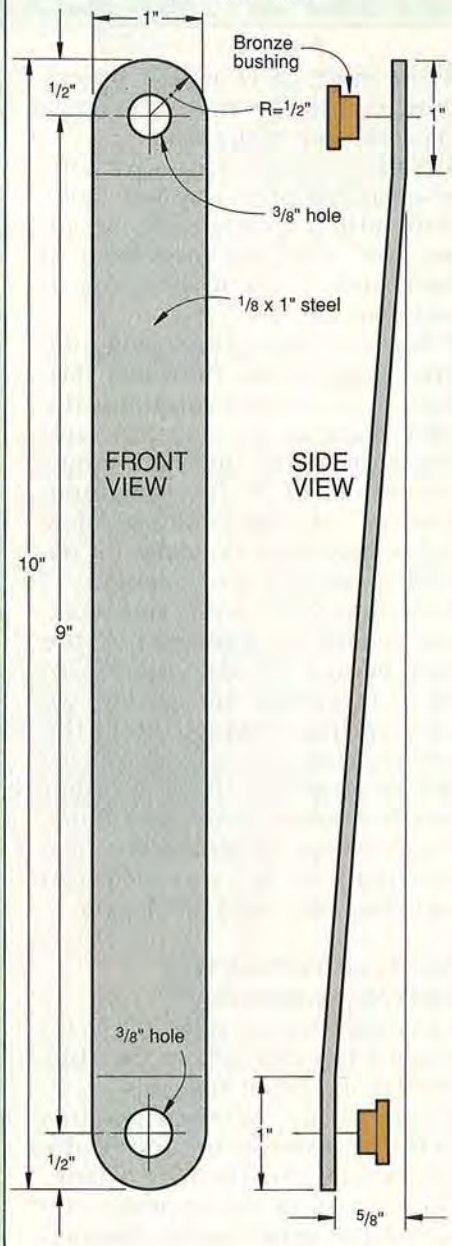
**Supplies:** 1¼", 1½", 2½" deck screws (see the Buying Guide for our source of stainless steel screws); 8–¼x2" roundhead stainless steel machine screws with ¼" lock nuts and flat washers; #6x⅝" brass flathead wood screws; ⅛x1x48" flat steel, 8½" of 2/0 open link coil chain and two ½" screw eyes; exterior finish.

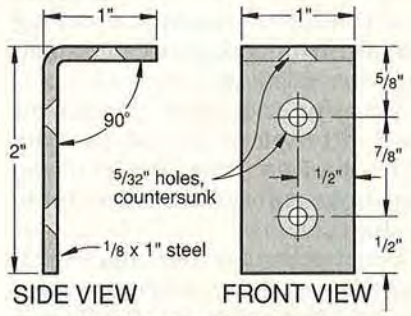
**Buying Guide**

**Stainless steel screws.** Flathead, square-drive #8 screws, 100 per box. One box each of 1¼", 1½", and 2½" screws plus two #2 drivers. Kit no. WD-GLIDER. $29.95 ppd. McFeely's, P.O. Box 3, Lynchburg, VA 24505-0003 or call 800/443-7937 or 804/846-2729 to order.

**Bronze bushings.** Eight ⅜" O.D., ¼" I.D., ¼" long bronze flanged bushings. Stock no. NLIFL26-2. $10 ppd. Standard Bearings, P.O. Box 823, Des Moines, IA 50304 or call 800/554-8123 to order.

**SWING ARM (4 required)**




**ANGLE BRACE (2 required)**

*Continued*

# EASY GLIDER

*front* edge of N at 15° where shown on the Section View drawing at the end of the article.

**6** Nail or clamp stops to your wooden drill-press auxiliary table. Now, drill a countersunk mounting hole, centered from front to back and ¾" from the ends of each seat slat.

**7** Rout a ½" round-over along the front edge of the front slat (M). Rout a ⅛" round-over along the back edge of the front slat and along the front and back edges (not ends) of all the remaining slats (M). See the Exploded View and Section View drawings for reference. Sand the slats smooth.

**8** Starting at the front and working toward the back, screw the slats, but not the rear cleat (N), in place. (To check the spacing, we used spring clamps to hold the last five slats and cleat N in place before attaching. It's important that N attaches to the seat frame where shown on the Section View drawing.) Set the rear cleat (N) aside for now; you'll add it later.

## Next, construct the backrest assembly

**1** Cut the backrest splats (O, P, Q) and the top cleat (R) to the sizes listed in the Bill of Materials.

**2** Transfer the full-sized patterns from the insert to the top of the splats, and cut them to shape. Then, crosscut the opposite end to cut the splats to the finished length stated on the patterns insert. Rout ⅛" round-overs along the top front edge of each splat. Sand the splats smooth.

**3** Transfer the apple pattern to the center splat (Q), 1⅝" from the top end of the splat. Drill a blade-start hole, and scrollsaw the apple to shape.

**4** Keeping the bottom edges flush and the good face down, position the backrest splats (O, P, Q) on a flat work surface. Place ½" spacers between the splats, starting with the center splat, and work toward the ends. Now, position the rear cleat (N) and top cleat (R) on the splats where dimensioned on the Section View drawing. The ends of the rear cleat (N) should protrude ½" beyond the outside edge of each end splat (O). Drill countersunk mounting holes, and screw the splats to the cleats. Keep the bottom ends of the splats flush with the bottom cleat (N). Use a framing square to keep the pieces square to each other.

**5** Set the seat frame assembly on your workbench.

**6** As shown in the photo *below*, clamp the backrest assembly to the seat frame, drill countersunk mounting holes, and screw the backrest bottom cleat (N) to the seat-frame rear crossmember (K) at 6" intervals.

## It's time to do a little assembly

**1** Place one end-frame assembly (F, G, H, I), outside face down, on your workbench. Use a framing square to mark a reference line on the *inside* face of the end frame 10⅞" from the top end. With the aid of a helper, position the seat assembly on the end frame so the bottom edge of the seat support (L) aligns with the marked reference line. See the Section View for positioning help. Drill mounting holes, and drive four screws through the seat support (L) and into the inside face of the end-frame slats (H). Repeat the process to attach the opposite end frame.

**2** Cut the armrests (S), supports (T), and armrest brace (U) to the sizes listed in the Bill of Materials. See the *WOOD PATTERNS*™ insert for the full-sized pattern of the supports (T). Cut the brace cleat (V) to size, bevel-ripping the front edge at 15°.

**3** Cut mating half-lap joints on the ends of the armrests and brace to the size shown on the Half-Lap detail accompanying the Exploded View drawing. Checking for square, glue and screw the armrests to the brace.

**4** Transfer the shape from the Armrest drawing, and cut the armrest front corners and outside back corners to shape. Using the pattern on the pattern insert, cut the supports (T) to shape.

**5** Position and clamp the armrest assembly (S, U) on top of the end frames and against the back face of the backrest assembly. Drill the mounting holes, and screw the assembly in place.

**Clamp the backrest assembly to the seat frame, drill countersunk mounting holes, and screw the backrest bottom cleat to the seat-frame rear crossmember.**

**6** Glue and screw the brace cleat (V) to the bottom side of the armrest brace (U). Now, drill countersunk mounting holes through the brace cleat and into the back of the splats. Drive screws through these holes.

## Forming the swing arms and braces comes next

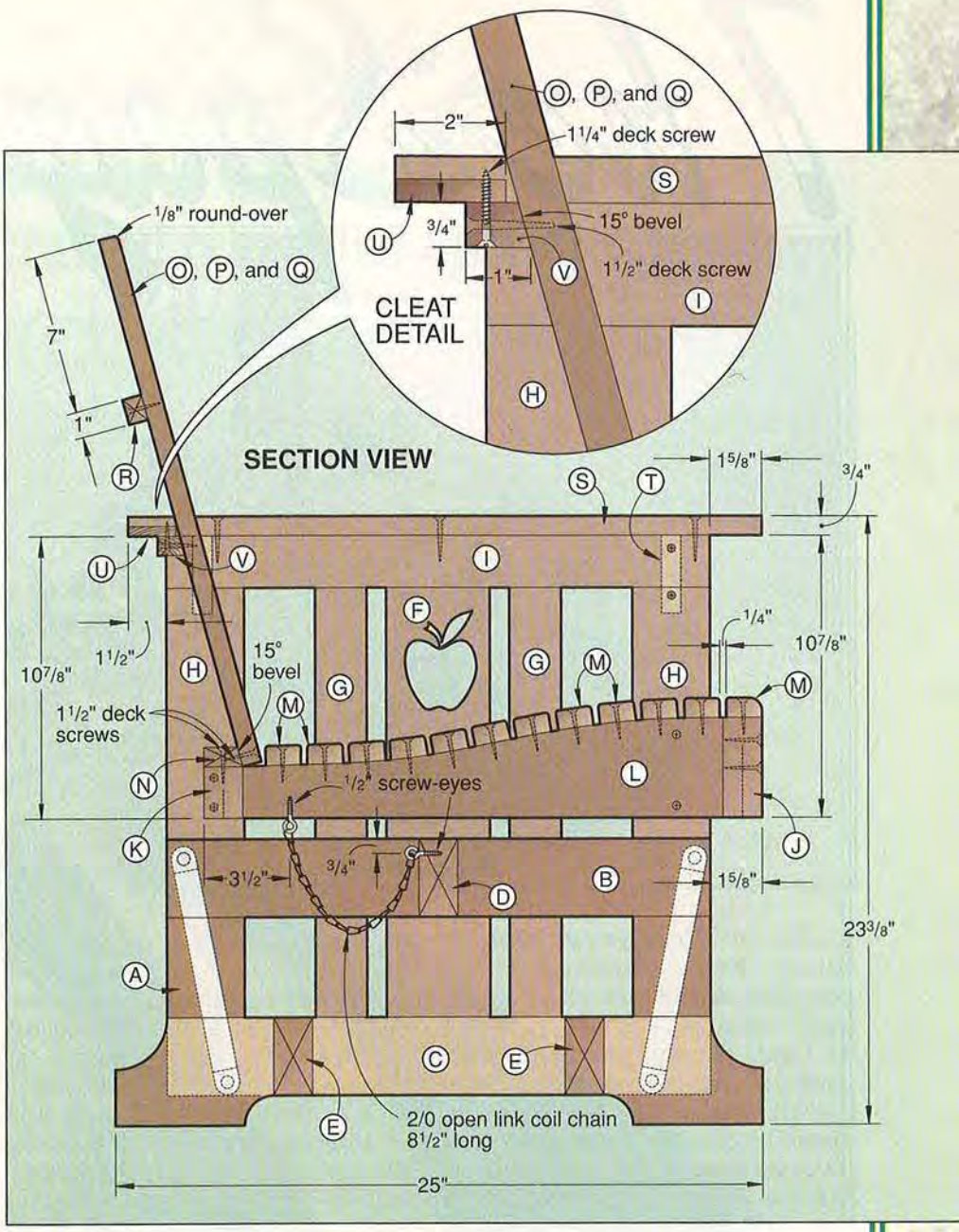
**1** From a ⅛×1×48" piece of flat steel, use a hacksaw to cut four pieces measuring 10" long each. Drill a ⅜" hole in each end of each swing arm where shown on the full-sized pattern insert. Grind the corners round.

**2** Clamp each end of each swing arm in your woodworker's vise, and bend to the angle shown on the full-sized pattern.

**3** To form a pair of angle braces, cut two 3"-long pieces from the remaining flat steel stock. Bend them to the shape shown on the pattern insert. Drill mounting holes, and screw the braces in the corner where parts K and H meet. The braces strengthen the joint.

**4** Press a bronze bushing into each ⅜" hole in each swing arm where shown on the pattern insert. See the Buying Guide for our source of bushings.

**Connect the steel swing arms from the rear holes in the base to the rear holes in the seat assembly.**




**5** As shown in the photo at *left*, position the seat assembly, back face down on either your workbench or the floor. Position the base in front of it, and connect the two swing arms from the rear top holes in the base to the rear holes in the seat assembly. Repeat the process to attach the front swing arms. Use a hacksaw to trim the protruding ends of the bolts flush with the outside ends of the locknuts.

**6** To keep the glider from swinging too far back, attach a pair of screw eyes and an 8½" length of 2/0 open link coil chain to parts D and the middle L where shown on the Section View drawing.

**7** Finish-sand the entire assembly, and add an exterior finish, we used Flood CFW (Clear Wood Finish). It's critical to get a good seal on the bottom of the base (those parts that come in direct contact with the ground or patio). Recoat the chair annually. For an added touch, paint the inside edges of the apples red and the stems and leaves green.


Written by Marlen Kemmet
Project Design: James R. Downing
Illustrations: Kim Downing; Lorna Johnson
Photographs: John Hetherington,

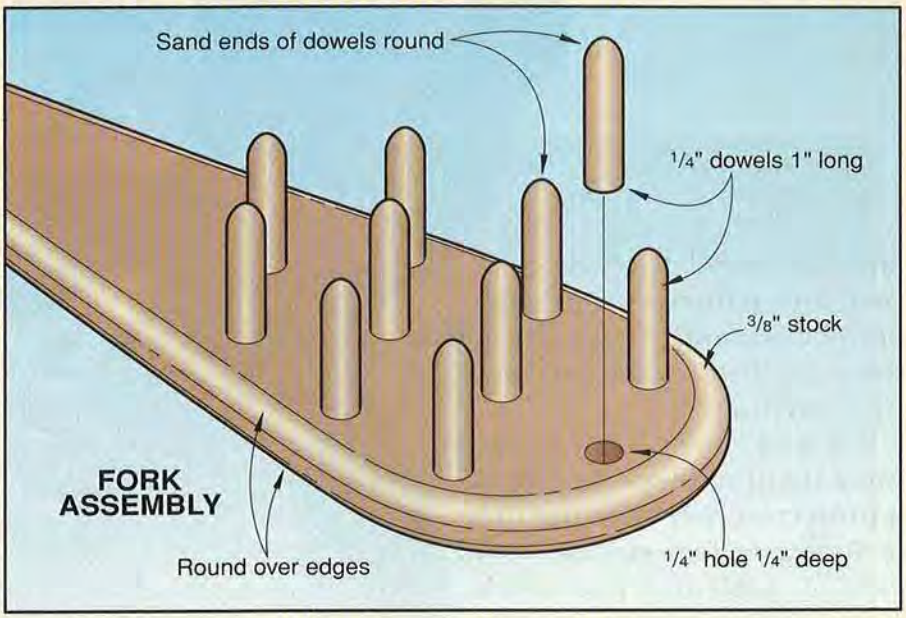
# The Spaghetti

# Specialists

Print this article

## Let this handcrafted trio spice up an Italian meal

**Whether plain old spaghetti or fashionable pasta, preparing and serving it will be a pleasure with this three-piece set. And you'll enjoy a woodworking feast of cutting and carving as you make these neat utensils.**




Cut two blanks ⅜×3×11" and one ¾×3×11". (We used walnut.) Photocopy the three full-sized patterns in the *WOOD PATTERNS™* insert in the middle of the magazine. Using spray adhesive, adhere the patterns for the spaghetti measure and the spaghetti server onto the ⅜" blanks, and the one for the sauce spoon onto the ¾" blank.

On each, drill a ⅛" blade start hole through the topmost heart on the handle. Scrollsaw the design on each. (We used a #4 blade, .035×.015" with 18 teeth per inch.) Don't cut around the outside pattern line yet

Drill the three holes in the spaghetti measure, using a drill press and Forstner bits. (The holes measure one, two, or three portions of uncooked spaghetti—you can label them, if you wish.)

For the spaghetti server, drill 10 ¼" holes ¼" deep where shown. The holes must be perpendicular to the face of the server for best appearance, so use the drill press.

Now, hollow out the inside of the spoon bowl. You can carve it out with gouges or with a carving bit held in either a rotary hand tool or a flexible-shaft machine.

No. 7 and no. 5 palm-handle gouges about 5/16" wide work well for gouge-carving the bowl. A spoon-bent gouge comes in handy, too. Rough out the bowl with the no. 7 gouge. Start from the inside rim line, and carve toward the center of the bowl. Hollow it out to a depth of about ⅝" at the center. Cut with or across the grain as you carve; if you go against the grain, you'll probably tear out long splinters.

After roughing the bowl, smooth the surface with the no. 5 gouge. For a fine, smoothing cut, slide the beveled side of the gouge along the carving surface, then raise the handle just enough to let the cutting edge shave off a thin curl of wood. The sharper your gouge, the better this will work. Sand the bowl smooth.

For rotary power-carving, rough out the bowl with a Kutzall or carbide burr. A cutter with a rounded end rather than a point would be a good choice for forming the shallow bowl. Smooth the roughed-out surface with a ruby carver, then sand.

Now, bandsaw the three utensils to shape. With a rasp, spokeshave, or drum sander, shape the back of the spoon handle and the outside of the bowl. The handle thickness tapers to 9/16" at a point 5¼" from the tip of the handle. Sand all three pieces to 220-grit, rounding over the outside edges. Round over the edges of the portion-sizing holes in the measurer, too.

Cut 10 pieces of ¼" walnut dowel rod 1" long. Sand one end of each round. Refer to the Fork Assembly drawing *above*, and glue the dowels into the holes in the server handle. Be sure to use moisture-resistant glue—you'll be dipping the fork into hot, wet noodles. (Slow-set epoxy would be a good choice.)

Finish with salad-bowl oil. In use, hand-wash and dry the utensils. Re-oil them periodically.

To use the portion measurer, grasp a bundle of uncooked spaghetti noodles in one hand. Put an end of the sheaf into the appropriate hole, adding or subtracting noodles to fit.

Project Design: © Kim and Rob Russell  Photograph: King Au  Illustrations: Kim Downing

# HOW TO HIDE YOUR WOODWORKING GOOFS

## Six fool-proof strategies for dealing with dings, dents, and divots

Print this article

**Let's face it—mistakes happen. Tools fall off shelves, projects get dropped, and hammers and chisels occasionally miss the mark. Even the best woodworkers mess up sometimes.**

**But you don't have to shell out a lot of money—or rebuild a project—every time the fickle finger of fate strikes. With careful, patient repair work, you can render practically invisible the most serious dents and dings. How so? To find out, we quizzed the shop experts on our staff and came up with six repair strategies every woodworker should know.**

## GOOF NO. 1: You've gashed the middle of an expensive piece of plywood.

## HERE'S THE CURE: Cut out the damaged area and insert a full-length filler strip.

Round, square, or football-shaped patches in damaged plywood always seem to stick out like a sore thumb. Our preferred technique—splicing in a filler strip that runs the full length of the workpiece—is easier to make and less visible.

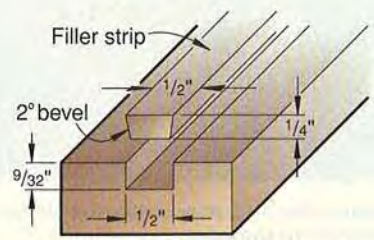
Start by matching the color and grain of a scrap piece of plywood with the area of the panel containing the gash, as shown in *Photo 1*. Then, remove the damaged area by cutting a full-length groove 9/32"-deep with the grain. Unless you have a high-quality dado set, use a router and straight bit to get the cleanest possible groove.

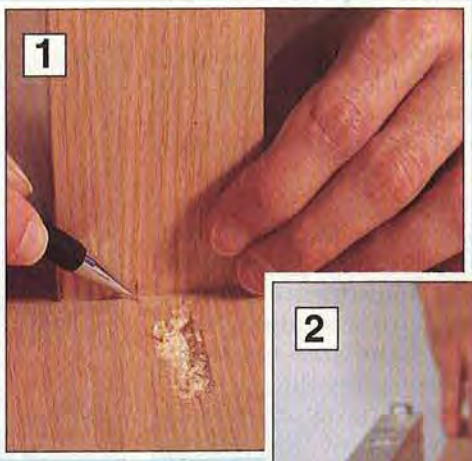
Next, tilt your tablesaw blade 2° from vertical and rip a beveled-edge filler strip to put in the groove as shown in the Full Length Filler Strip drawing *below*. Make sure you bevel both edges of the filler strip. Now, turn your filler strip on edge and rip it down to ¼" in thickness. Use a wooden pushstick for safety. The tapered edges of the filler strip prevent it from binding when you tap it into the groove and give excess glue a place to escape.

Now, apply woodworker's glue to the filler strip and groove. Push the filler strip into the groove, but leave it slightly above the surface of the workpiece. Place a flat piece of hardwood over the groove and tap on it with a hammer to bring the strip flush with the top of the panel as shown in *Photo 4*. After the glue dries, a light sanding will help hide the joint lines of the filler strip. You also can use this technique on solid stock to remove naturally occurring defects such as knots and checks.

*Continued*

FULL-LENGTH FILLER STRIP




*Left:* Match a scrap piece with the color and grain pattern of the damaged area.

*Right:* Cut a shallow groove across the damaged area with the grain using a dado blade. If you don't have a good dado blade, use a router and straight bit.

*Left:* From your matched piece of scrap plywood, rip a filler strip with your tablesaw blade set at 2° from vertical.

*Right:* Apply glue to the filler strip and groove, and tap the filler strip into place with a flat hardwood block and hammer.

# HIDE YOUR WOODWORKING GOOFS

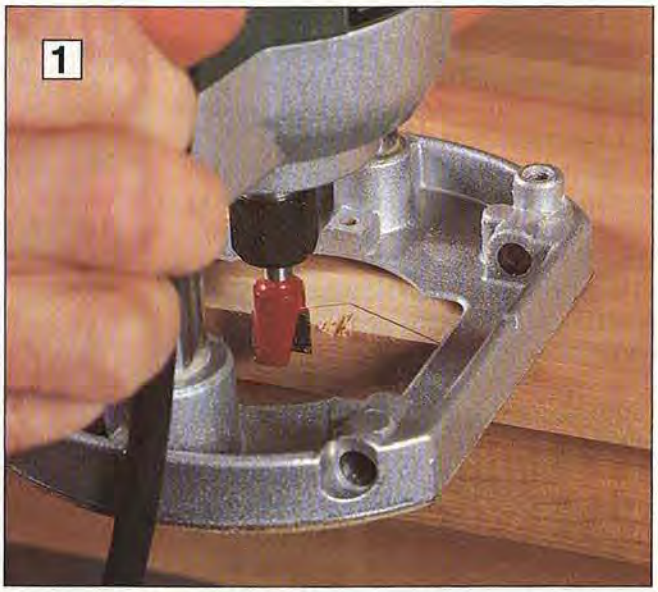
## GOOF NO. 2: You've gouged the edge of a board.
## HERE'S THE CURE: Glue in a patch.

Start by comparing scraps to the damaged area, and look for a close match of color and grain pattern. When you've found a similar piece, make a triangular patch. Cut the patch as thick as you need to cover the depth of the gash plus about 1/16".

Mark the outline of the patch onto the face of the board around the gash. Don't place the edge of the patch flush with the edge of the workpiece, though. Leave about 1/8" overhang on the patch to allow for adjustments and trimming later. Now, using a router with a straight bit as shown in *Photo 1*, rout as much of the area inside the scribed triangle as you can without touching the lines.

When you're done routing, take a sharp chisel and pare down along the lines for the patch as shown in *Photo 2*. Next, place the chisel horizontally on the flat surface created by the router and remove the waste by chopping back toward the vertical chisel cuts.

Now, test-fit the patch. If it does not quite fit, adjust it by sanding the inside edges. When you've got a tight fit, coat the mating surfaces with woodworker's glue, as shown in *Photo 3,* and clamp the patch in place. After the glue dries, trim and sand the patch flush.




**Rout out the damaged wood and most of the patch area, but without touching the patch outlines.**

## GOOF NO. 3: You've dropped a board and smashed one corner.
## HERE'S THE CURE: Use instant glue to attach a new corner.

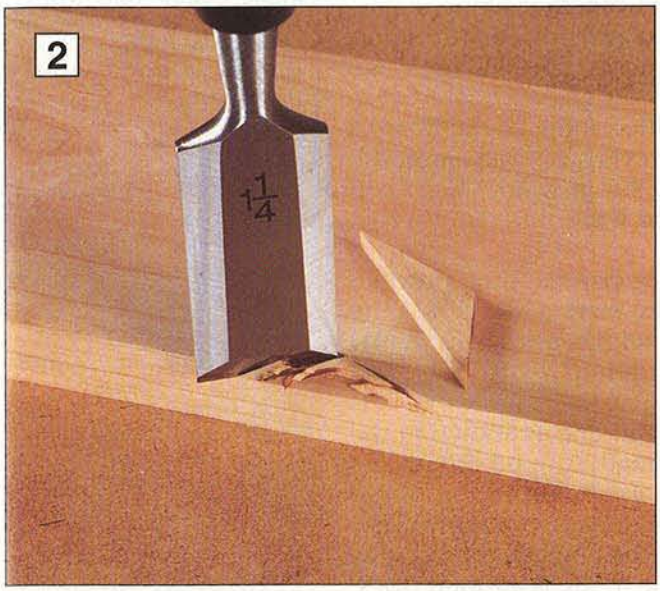
With a sharp chisel, cut away the damaged corner of the board as shown in *Photo 1*. Position the front edge of the chisel at 45° to the edge of the board so that it removes the same amount of wood from the face and the edge of the workpiece. With the chisel, trim this cut as necessary to ensure that it's perfectly straight and flat.

Next, cut a wedge-shaped patch from a matching piece of scrap as shown in *Photo 2*. A dozuki (a Japanese-style handsaw) or other fine-toothed handsaw works best. Make the patch large enough so you have extra wood to trim off later. If the kerf side of the patch is rough, flatten it on a piece of sandpaper taped to a flat, hard surface.

Use cyanoacrylate (instant) glue and accelerator to fasten the patch to the pared-down edge, as shown in *Photo 3*. You need only hold the patch to the workpiece for a few seconds with CA glue, thus eliminating the need for clamps. After the glue dries, use a hand plane or sanding block to bring the edges of the patch flush with the workpiece.

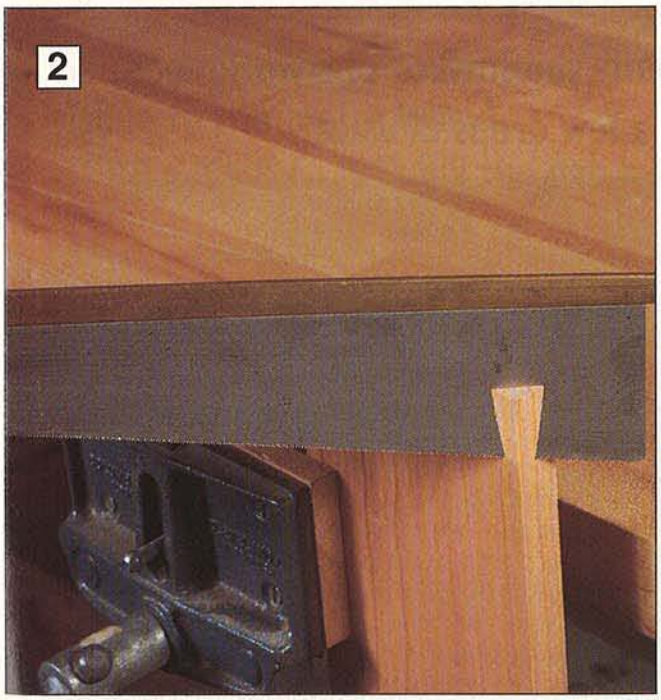
*Continued*

**Secure the board in a woodworking vise and pare away the dented corner with the chisel positioned at 45° to the edge.**




Chop along the lines of the patch with a chisel, taking care not to slice deeper than the area cut by the router.

Adjust the patch for a tight fit by lightly sanding its inside edges, then glue and clamp the patch in place.




With a dozuki or other fine-toothed handsaw, cut the patch from a matching piece of scrapwood.

Use cyanoacrylate (instant) glue and accelerator to join the patch to the workpiece, and hold the patch in place until the glue dries.

# HIDE YOUR WOODWORKING GOOFS

## GOOF NO. 4: You've cut a board an inch too short, or you can't find a board long

## HERE'S THE CURE: Build a "board stretcher."

Our "board stretcher" is actually a jig that helps you make scarf joints. What's a scarf joint? It's like a butt joint where two workpieces are glued together along a low-angle cut. The lower the angle, the more glue surface you provide for the joint, hence the stronger the joint. An angle of 20° works well, and that's the angle we built into our jig.

To use a scarf joint to lengthen a board, you have to sacrifice some of the board's width. See the How to Stretch a Board drawing at *right*. For every 1" you gain in the length of the board with a scarf joint, you'll have to sacrifice 7/16" in width. Also keep in mind that cutting and trimming a 20° line across the board will eat up another ¾" in the length of the board.

If the board you cut too short is wide enough to meet these criteria, then proceed to build the scarf-joint jig shown in the drawing. Use the jig to mark a line across the midsection of the workpiece, and then cut along that line with a portable circular saw. Now, clamp the jig to the workpiece, as shown in the photo *above right*, and clean up the cut edge with a router and a flush-trim bit.

Now, place the two edges together. Slide them along the joint line as shown in the How to Stretch a Board drawing until you have the needed length. Cut off the excess width on each board, and then glue and clamp the pieces as shown in the photo *below right*. The triangular blocks prevent the pieces from sliding as you tighten the clamps. Attach the blocks with CA glue. For 20° scarf joints, the angle at the narrowest corner of the clamp block should equal 20°. After the glue in the scarf joint dries, trim off the clamp blocks. This procedure works for boards cut too short as well as for boards you wish to lengthen.

**Note:** *Unlike our other repair techniques, a scarf joint will almost always show up as a visible line. Paint will cover the line, and closely matching grain and color also help. But don't put a scarf joint in a prominent location on projects that take a clear finish. Also, scarf joints aren't as strong as a solid piece of stock. Don't use them to carry loads or bridge a span. When in doubt about the strength, add a spline or biscuits to reinforce the joint.*

*Right:* Clamp your workpiece and scarf- joint jig to your workbench and trim the edge of the workpiece flush.

*Right:* Clamp the scarf joint using angled clamp blocks to keep the clamping pressure perpendicular to the joint.

## GOOF NO. 5: A misplaced hammer blow dents the surface of a workpiece.

## HERE'S THE CURE: Raise the dent up with a few drops of water.

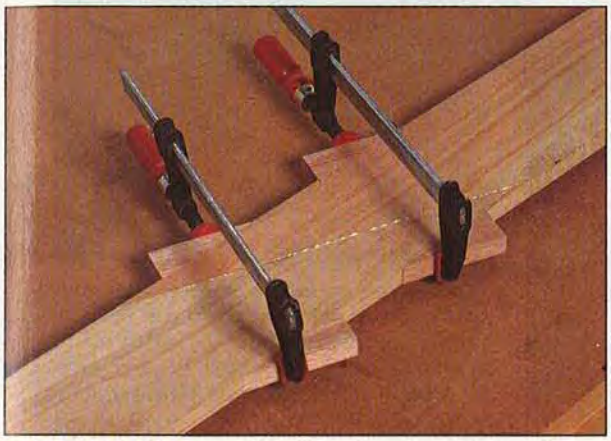
If you've got a shallow dent and the wood fibers are not torn or broken, a few drops of water will swell the fibers and cause them to return to their original position. As shown in the photo *right*, apply the drops of water with an eye dropper, and wet only the dented area. Check the workpiece every hour or so. If the water soaks in, add more water until the dent is gone.

After soaking the wood, you'll probably see a small water stain and some fuzzy wood fibers where the dent was. Let the wetted area dry thoroughly, and then sand the spot until the water stain and raised fibers disappear.

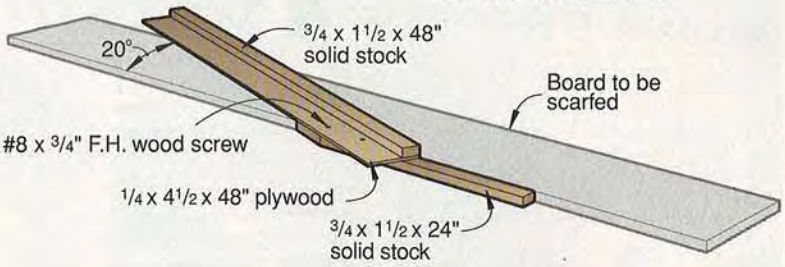
You sometimes can get quicker results by steaming the dent with a clothes iron. Be careful not to scorch the surface of the wood or raise the grain on a large section. Instead, wet the corner of a rag or towel, place it in the dent, and steam the dent through the rag with the pointed front end of the iron.

**Fill the dented area with water from an eye dropper. Repeat until the dent rises up flush with the surrounding surface.**

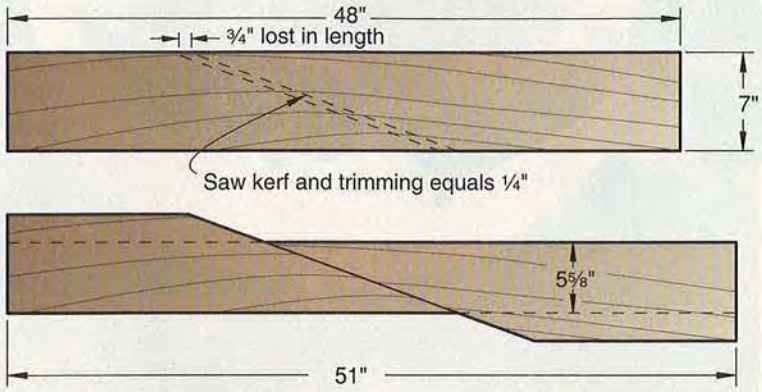
enough for the job.



SCARF-JOINT JIG




HOW TO STRETCH A BOARD




For every inch of length gained, you lose 7/16" in width.

## GOOF NO. 6: Your miter joint doesn't quite fit and the resulting gap appears visible to the entire world.

## HERE'S THE CURE: Fill the gap by pushing the wood fibers together.

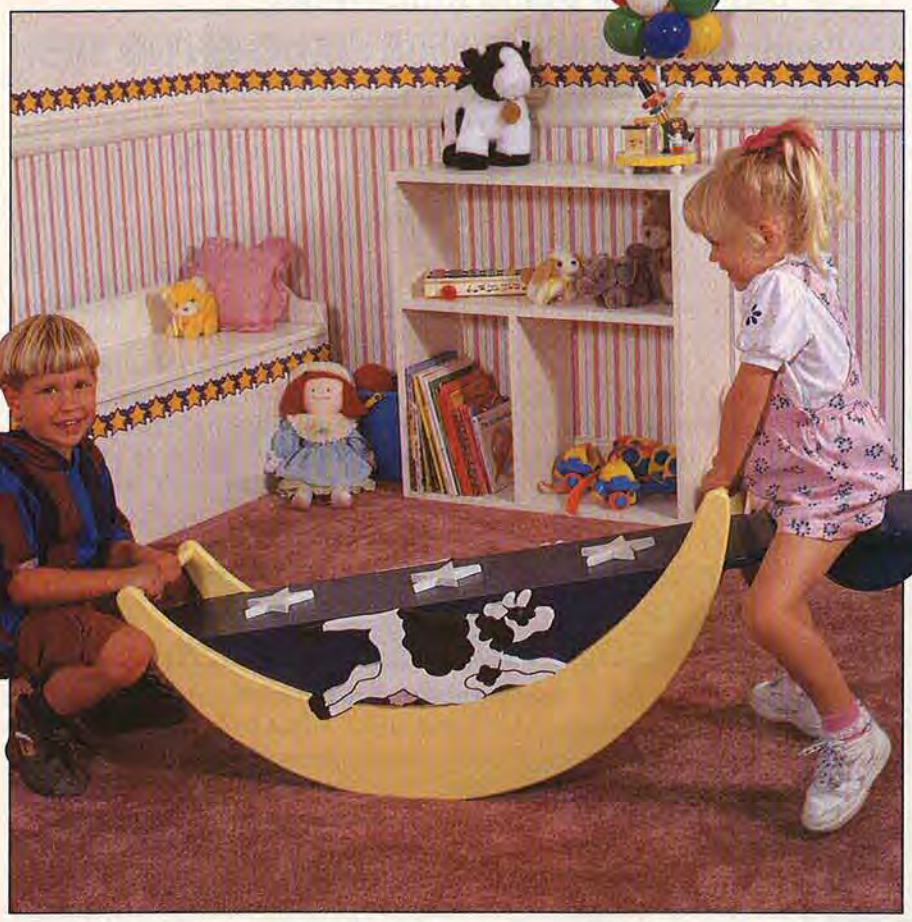
With a smooth, round, steel implement (the side of a nailset works great), push across and slightly down on both edges of the miter, as shown in the photo at *right*. As you apply pressure, the gap in the joint will narrow and close up.

The objective is not to flatten the corner, but to bend the edges of the wood fibers a few degrees. Keep in mind that this only works on hairline gaps no wider than about 1/32". You will get a slightly rounded appearance where the two pieces meet, but you can minimize the roundness of the corner by lightly sanding both faces of the project. Use a sanding block rather than hand sanding.

**Push down on the edges of an open miter joint to close the gap.**

Written by Tom Jackson Photographs: John Hetherington Opening photo: King Au Illustrations: Mike Gatzke

# KID-RIFFIC TEETER-



**For use indoors or out, this cleverly designed playtime project will send kids to the moon with excitement, literally. Themed after the legendary cow that jumped over the moon, our teeter-totter design features stops beneath the seats to safely control the rocking motion.**

## Let's start with the seat and stops

**1** From ¾" plywood, rip and crosscut the seat (A) to size. (We used MDO plywood for the entire project; see the box on the *opposite page* for more information on this sheet-good product.)

**2** Using the full-sized patterns on the *WOOD PATTERNS*™ insert in the center of the magazine, transfer the Seat-End pattern including the hole centerpoints to both ends of the plywood seat blank. Cut and sand the seat to shape.

**3** Transfer the Stop (B) pattern to the plywood two times, and then cut the stops to shape.

**4** Drill mounting holes near both ends of the seat (A), drive screws through the holes, and press the stops (B) against the protruding screws to transfer the centerpoints. Drill holes in the stops where indented. Glue and screw the stops to the seat bottom.

## Now, add the rockers

**1** To make the rockers (C), you'll need to transfer the full-sized Moon half pattern, hole centerpoints, and seat location twice to a piece of plywood, joining the patterns at the centerline. Transfer the full-sized Cow pattern to the top edge of the marked moon, aligning the centerline of the cow with that of the moon patterns. For making numerous projects, transfer the shapes to hardboard, and cut to shape to form templates.

**2** Supporting the plywood with the marked rocker/cow pattern on your workbench, jigsaw one rocker (C) to shape. For support when cutting the narrow cow's tail to shape, position the rocker blank on the edge of the table as shown in the photo *below*.

**Clamp the rocker to your workbench for support when cutting the narrow cow's tail to shape.**

**3** Sand the edges of the rocker (moon/cow) smooth, and then use this rocker as a template to mark the moon and cow outline onto plywood. Cut the second rocker/cow to shape.

**4** Clamp the rockers together with the edges flush. Using a belt sander, sand the top and bottom curved edges of the rockers flush. Now, drill 5⁄32" counterbored mounting holes through the *outside face* of each rocker for attaching the seat (A), crossmember (E), and dowel handles later. Unclamp the pieces.

**5** Using the holes at the handle location for reference, use a Forstner bit to drill a pair of ¾" holes ¼" deep, centered over the 5⁄32" holes on the *inside surface* of each rocker.

## Next, machine the rest of the pieces

**1** Transfer the Background (D) half pattern to plywood twice, and use a jigsaw or bandsaw to cut the two pieces to shape.

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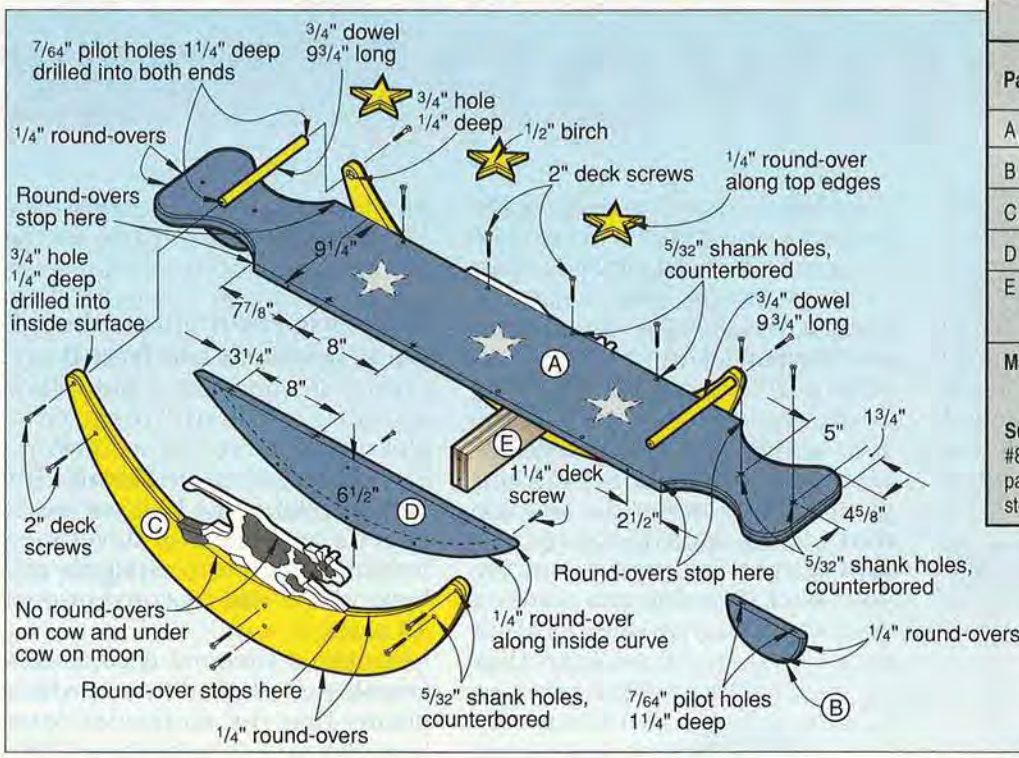
# TOTTER It's out of this world




**EXPLODED VIEW**

**Bill of Materials**

| Part | Finished Size T | W | L | Matl. | Qty. |
|---|---|---|---|---|---|
| A seat | ¾" | 9¼" | 60" | PW | 1 |
| B stops | ¾" | 3¾" | 7½" | PW | 2 |
| C rockers | ¾" | 16" | 38" | PW | 2 |
| D background | ¾" | 6½" | 31" | PW | 2 |
| E cross-member | 1½" | 3½" | | LP | 1 |

**Materials Key:** PW-plywood, LP-laminated plywood or a piece of a 2×4.

**Supplies:** ¾" dowel stock, #8×1¼" deck screws, #8×2" deck screws, wood filler, latex primer and paints, water-based polyurethane, ½"-thick birch stock for the three decorative stars.

**2** Mark the hole centerpoints for attaching the backgrounds (D) to the inside surface of the rockers (C), and drill countersunk holes.

**3** Laminate two pieces of ¾"-thick plywood together, or crosscut a section from a piece of 2×4 to form the crossmember (E).

**4** Transfer the star pattern to ½" birch stock three times, and cut to shape. Rout or sand a round-over along the top edges of each. Left as is, the corners of the stars are sharp. Glue the stars in place.

**5** Cut two pieces of ¾" dowel to 9¾" long for the handles.

## Assemble the teeter totter

**1** Dry-clamp (no glue) the pieces, including the dowel handles, together. Now, using the holes in the rockers (C) as guide holes, drill 7/64" pilot holes 1¼" deep centered in each end of each dowel handle. Disassemble the project.

**2** Rout ¼" round-overs on the pieces where marked on the Exploded View drawing.

**3** Fill any voids and sand all routed edges smooth.

**4** Glue and screw the background pieces (D) centered from end-to-end on the bottom outside edges of the seat. Use a framing square to ensure that the ends of the background pieces are directly across from each other.

**5** Glue and screw the seat/background assembly (A/D), cross brace (E), and dowel handles between the rockers (C). Take your time to keep the assemblies square to each other.

## Now, give the project a spectacular paint job

**1** Fill the counterbores with wood putty and sand smooth. Slowly and carefully run your hands across all surfaces and edges to feel for rough edges caused by protruding filler. Sand where necessary. Any unevenness will become more prominent once painted.

**2** Prime the entire project (we used a latex primer), and allow to dry for 24 hours. Transfer the paint lines, and paint the blue areas (we used a 1" brush for the larger areas and a #8 for the tight spots). Paint the yellow areas, then the white, and finally the black and pink. For added protection, add two coats of water-based polyurethane.

### MDO: The Sign Painter's Choice

Medium density overlay plywood (commonly called MDO) is an exterior-grade plywood with an impregnated-paper overlay to conceal the grain and provide a smooth surface for painting. Because of this, MDO is a favorite among professional sign painters.

AC-grade MDO plywood has paper on one side, and AB-grade MDO has paper on both sides (we used the AB grade for this project). If it is available, purchase MDO with the lauan crossband directly under the paper overlay rather than the fir veneer next to the paper. The repaired surface (football-shaped patches) of the fir plywood will tend to telegraph the repairs through the paper while the crossband has no repair patches to show through.

Written by Marlen Kemmet Project Design: Christine Anderson Illustrations: Jamie Downing, Roxanne LeMoine Photographs: John Hetherington

# WOOD® MAGAZINE'S GUIDE TO TODAY'S ADVANCED WOODWORKING

Why would anyone pay $20 for a bottle of glue? That's the question we faced when we first tried the new polyurethane-based glues Excel and Gorilla Glue. And the more we studied these glues, the more we realized that they open up a whole new world of options. But traditional woodworker's glues also have taken several strides forward in the past few years. So we decided to compare the new polyurethane glues with two of the more advanced aliphatic resin (AR) glues on the market—Elmer's Weather-Tite Wood Glue and Franklin's Tite-bond II.

Our goal was not to conduct a head-to-head contest to find out who has the best glue. Rather, we wanted to find out what each glue can and cannot do, and use that information to figure out how to get the most bond for your buck. We also ran across a new speciality product called RooClear that offers hope to woodworkers who have strug-gled when trying to glue up melamine-coated sheetgoods. (See "What About RooClear?" in the box on *page 73.*)

To see how well these glues worked we glued and broke hundreds of samples.

## Aliphatic resin glues: the woodworker's old friend

Creamy in consistency and yellow in color, aliphatic resin (AR) glues have served as woodworker's trusted companions for decades. But in the last four years, Elmer's and Franklin developed formulas that perform above and beyond the call of conventional AR glues.

Franklin's Titebond II contains a cross-linked aliphatic resin which means that the molecules form long chains as the glue cures. This gives it increased resistance to water penetration. Elmer's Weather-Tite Wood Glue derives its distinction from a gel formula that contains finely ground particles of wood. The gel formula causes the squeeze-out to bead up neatly on the joint line and helps conceal glue lines by absorbing stains and finishes better.

## Polyurethane glues: the new kids on the block

Developed in Europe about ten years ago, polyurethane glues were formulated to replace epoxies which give off fumes that can pose health hazards. But unlike epoxies which you must mix with a catalyst, Excel and Gorilla Glue come ready to



Print this article

# GLUES

use straight from the bottle. And unlike AR glues, which require evaporation of a solvent, the polyurethanes contain little or no solvent. For a catalyst, the polyurethanes need only moisture in the air and wood.

## TESTING THE GLUES
### Here's what we found

### •Drying time

In our chart on *page 73*, we refer to "open time," (the amount of time you have to apply the glue and adjust the pieces before the glue sets up), and "clamp time," (the length of time you need to leave the workpiece in clamps). In both open and clamp time, Elmer's Weather-Tite Wood Glue and Titebond II cure much more quickly than the polyurethanes. This has advantages and disadvantages, depending on the project.

The shorter clamping times of the AR glues enable you to reuse your clamps sooner—an important consideration when you have more assemblies than clamps. The longer open times offered by polyurethane glues come in handy when you are dealing with complicated assemblies. In our tests, the polyurethane glues allowed us to tweak and reposition pieces for up to 20 minutes.

### •Application/spreadability

With their honeylike consistency and longer open times, polyurethanes spread easily, especially over large surfaces. Ounce for ounce, we found that the polyurethanes cover 50–100% more area than the AR glues. Elmer's Weather-Tite Wood Glue and Titebond II skin over fairly quickly, and become difficult to spread or squeegee after 4 to 5 minutes. Another time-saving benefit we discovered with the polyurethanes is that you apply them to just one surface instead of the two required by AR glues.

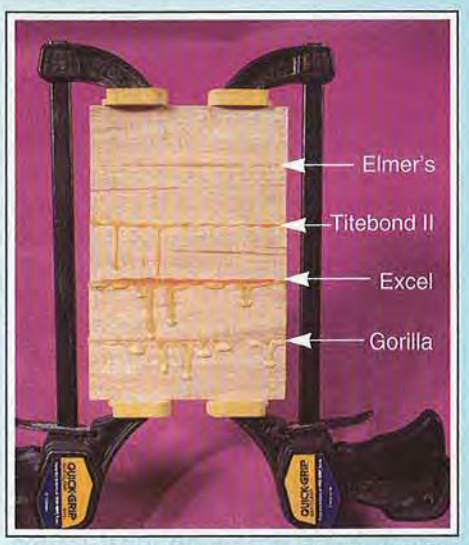
If you are accustomed to spreading AR glue with a fingertip, you will need to change methods with the polyurethanes. These require a solvent such as alcohol or mineral spirits for cleaning, and can stain your skin and gum up your hands. Apply polyurethanes with a stiff brush or squeegee.

### •Squeeze-out/expansion

Excel and Gorilla Glue expand as they cure, much like spray-foam insulation. If you spread them too thick, the squeeze-out turns into a torrent. Elmer's gel formula offers the least-messy squeeze-out—a nice feature on vertical glue-ups where excess glue might run down the side of your project.

The expansion of the polyurethane glues helps to fill gaps in furniture repairs where dowels have loosened slightly in their holes, or joints fit with less than their original precision. In our testing, we discovered that Gorilla swells up roughly a third more than Excel.

**Polyurethane glues spread easily and need only be applied to one side or edge of a workpiece, making them ideal for large or complicated glue-ups.**




**On vertical applications, glue squeeze-out can lead to a sticky situation. We purposely overloaded these joints to show how Elmer's Weather-Tite Wood Glue gel formula resists running.**

**Scraping off dried polyurethane glue proves easy and won't dull or nick your cutting edges like AR glues can.**

*Continued*

This expansion ability however, won't compensate for sloppy work. Both manufacturers caution that the polyurethane glues will not provide structural gap filling beyond 0.1mm.

### •Water resistance

In our tests that involved repeated soaking and drying, none of the joints we glued delaminated. The Elmer's Weather-Tite Wood Glue did soften while wet, but regained its hardness after drying. Completely submerged, however, the Elmer's glue line broke first, after three days. Titebond II broke after six days and the polyurethanes remained intact.

Titebond II, however, has passed national standards for type-II water-resistance testing. This means you can leave projects glued with Titebond II exposed to the rain as long as they are not submerged in water. Excel and Gorilla are both waterproof, meaning you can submerge these joints underwater indefinitely.

### •Sanding ease

When sanded, Excel and Gorilla Glue turn into a fine powder. They also yield easily to a scraper and don't dull your tool edges. Elmer's Weather-Tite Wood Glue and Titebond II tend to soften and gum up the abrasive when you smooth them with a belt or pad sander. They also can nick your scraper and chisel edges.

### •Creep resistance

When you glue a flush assembly of different woods, or pieces with their grain running in different directions, you may detect a slight bump at the glue line a few months later. This phenomena is called creep. It happens when the wood shrinks or swells at different rates and the glue bond, if it is flexible, allows the pieces to move independently.

In our tests, Titebond II resisted creep better than Elmer's Weather-Tite Wood Glue. The polyurethanes, however, are "non-thermoplastic," meaning they allow little or no flexibility at the glue joint. When an assembly glued with polyurethane shrinks or swells, all the pieces move together due to the rigidity of the glue joint. The result: creeping is reduced or eliminated.

### •Bonding strength

All the glues demonstrated more-than-adequate strength on edge-grain glue-ups. When we tried to break these, the wood failed, not the glue line. End-grain glue ups proved less successful. Titebond II scored the best here, followed by Elmer's Weather-Tite Wood Glue, and then the polyurethanes.

Although the makers of the polyurethanes claim their products work better than other glues on oily woods such as teak, we found that all four products performed equally well on our teak edge grain. Your results, however, may vary depending on the oiliness of the wood. Experiment by gluing up a few scraps before you commit a large project to a particular glue.

We did find a difference in gluing aluminum and brass to wood. Here, the polyurethanes held fast, while Elmer's and Titebond II failed to bond to the metal.

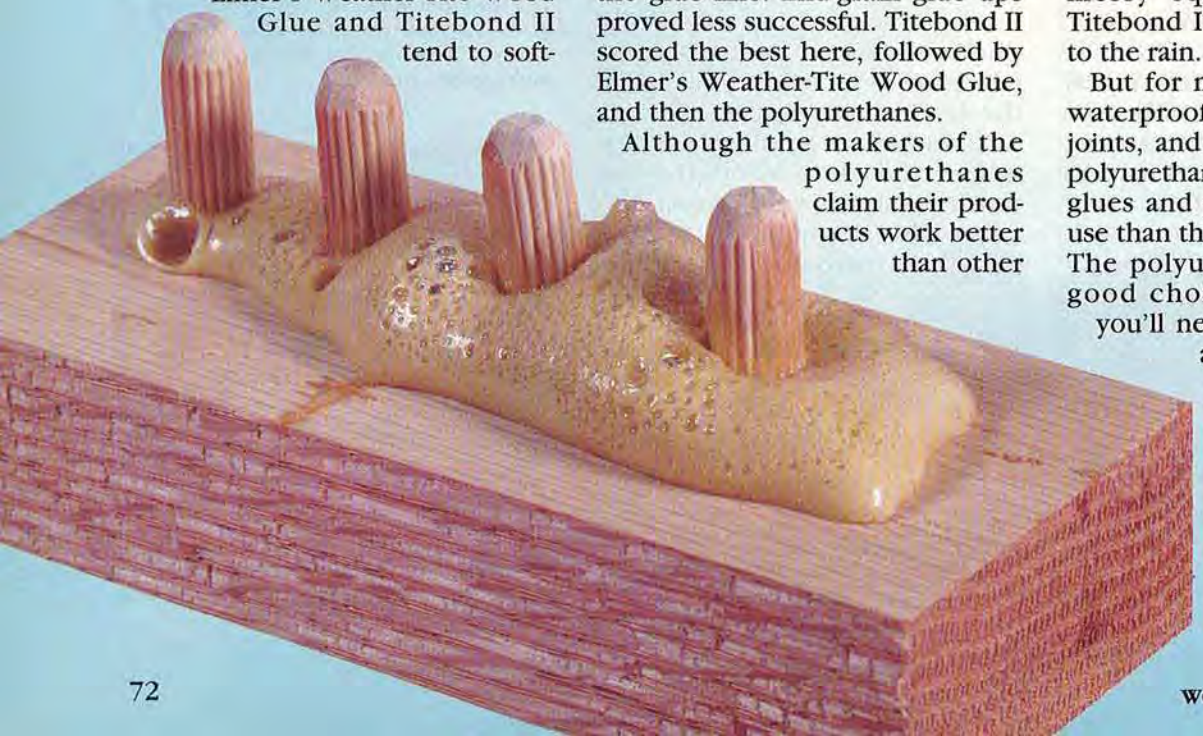
### •Price

The chart at *right* shows the cost per ounce of each of the glues. The cost will vary depending on the size of container you buy. The more you buy, the less you pay per ounce. And keep in mind that the high cost of the polyurethanes can be partially offset by the fact that you get more coverage per ounce.

## Our recommendations

Elmer's Weather-Tite Wood Glue and Titebond II do a good job at a price that's hard to beat. They still deserve a spot on every woodworker's shelf. Choose Elmer's Weather-Tite Wood Glue when you want to prevent a messy squeeze-out, and use Titebond II for projects exposed to the rain.

But for many specific needs—waterproof joints, metal-to-wood joints, and creep resistance—the polyurethanes outperform the AR glues and prove much easier to use than the old two-part epoxies. The polyurethanes also make a good choice when you know you'll need extra open time to assemble a glue-up with a lot of parts, or you anticipate lots of sanding or scraping.



**As they cure, polyurethane glues expand, forcing the glue into the wood fibers and helping to fill small gaps.**

## COMPARING THE NEW GLUES

| MANUFACTURER AND BRAND | GLUE TYPE (1) | OPEN TIME (MINUTES) | CLAMP TIME (HOURS) | CLEAN-UP SOLVENT (2) | SHELF LIFE (YEARS) | PERFORMANCE (3): WATER RESISTANCE (4) | EASE OF SANDING (5) | SPREADABILITY (6) | STAIN ABSORPTION (7) | CREEP (8) | BONDING STRENGTH (9): EDGE GRAIN: OAK | EDGE GRAIN: MAPLE | EDGE GRAIN: WALNUT | EDGE GRAIN: TEAK | END GRAIN: OAK | END GRAIN: MAPLE | END GRAIN: WALNUT | END GRAIN: TEAK | PRICE PER OUNCE (10) | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FRANKLIN TITEBOND II | AR | 10 | 1 | W | 1 | G | G | G | P | G | E | E | E | E | E | E | G | G | $ .52 | Penetrates deep into wood fibers for excellent bonding strength. Not water-proof like the polyurethanes, but will shrug off rain. |
| ELMER'S WEATHER-TITE | AR | 10 | 1 | W | 1 | F | G | G | G | G | E | G | E | E | E | G | E | E | .51 | Less water-resistant than Titebond II, but the gel formula prevents messy squeeze-out and wood fibers help absorb stains. |
| GORILLA GLUE | P | 20 | 1-4 | MS | 1 | E | E | E | F | E | E | G | E | E | G | G | G | G | .88 | The most expensive per ounce, but expands more and offers a shorter clamp time than Excel. |
| EXCEL | P | 20 | 1-12 | MS | 1 | E | E | E | F | E | E | E | E | E | G | G | G | G | .62 | A high-performance polyurethane at a price that's not much more expensive than the aliphatic-resin glues. |

**NOTES:**

1. (AR) Aliphatic resin (P) Polyurethane
2. (W) Water (MS) Mineral spirits
3. E Excellent, G Good, F Fair, P Poor
4. Samples soaked and dried twice, then observed for delamination.
5. Graded on both effort and sandpaper loading.
6. Ability to wet the wood and amount required.
7. Mahogany stain on maple.
8. Graded on whether glue line could be felt after soaking and drying cross-grain laminations.
9. Observed bond strength.
10. Price varies depending on volume of container.

Although Gorilla Glue costs roughly 30% more than Excel, we didn't detect any significant performance differences once they had dried. That makes Excel a better buy per ounce in the bottle, but these glues are not entirely identical. Gorilla Glue is solvent-free and odorless, whereas Excel contains about 5% solvent by volume and imparts a slight odor. And, Gorilla expands more than Excel, and offers a shorter clamp time.

### How to find these glues

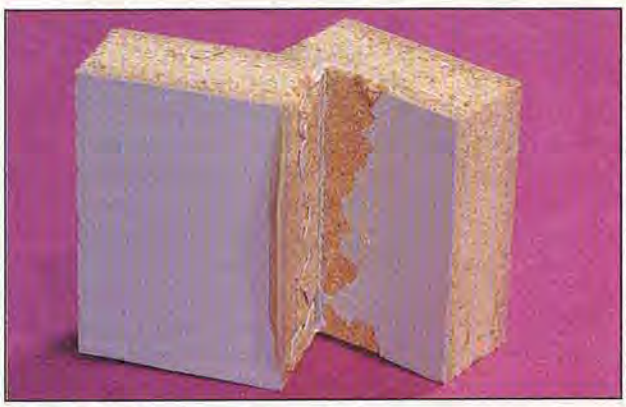
You can find Elmer's Weather-Tite Wood Glue and Franklin's Titebond II in most hardware or homecenter stores. For more information on Elmer's call 800/848-9400. To find out about Frankin's glues, call 800/877-4583. Excel, Gorilla Glue, and RooClear are sold primarily through woodworking catalogs and some retail outlets. To find out where to buy Excel, call 800/779-3935. You can order Gorilla Glue direct by calling 800/966-3458. For information on RooClear, call 503/588-0788.

### What About RooClear?

Even though it isn't a conventional woodworking glue, RooClear solves one of woodworking's most time-consuming problems—how to glue melamine-coated particleboard used in cabinets and countertops.

Before RooClear came along, the only way to glue two perpendicular pieces coated with melamine was to rout away the thin melamine layer on one piece to get a particleboard-to-particleboard bond. With RooClear, you simply apply it to both mating surfaces, clamp or screw the pieces together, and wait four hours. If you manage to pull this joint apart, you'll wind up tearing the melamine, as shown in the photo *below*.

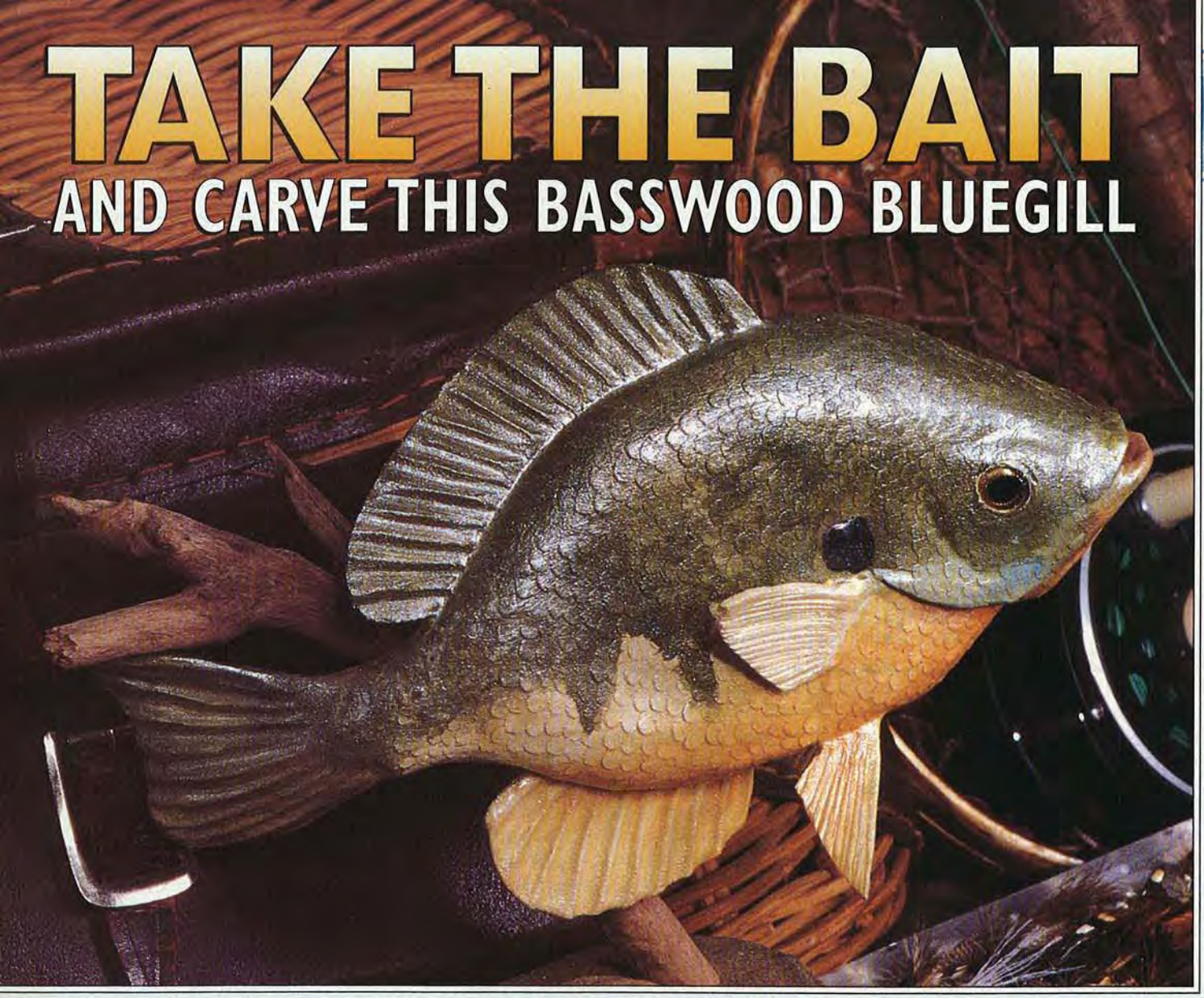
RooClear costs about $.50 per ounce, and gives you 20 minutes open time and 4 hours clamp time. It's not water resistant and it doesn't sand well, but the undried glue cleans up easily with water. In addition to melamine, you can use it on PVC, vinyl, particleboard, stone, metal, and wood. But RooClear acts like a flexible construction adhesive. This makes it less desirable for wood and materials you can join with AR or polyurethane glues that create a more rigid bond.



**RooClear bonds so well to melamine-coated particleboard that a joint, when stressed, will rip the melamine facing off rather than fail at the glue line.**

Written by Tom Jackson Technical consultant: Dave Henderson Photographs: John Hetherington

# TAKE THE BAIT
## AND CARVE THIS BASSWOOD BLUEGILL



### Project prep

**Stock:** Basswood or other carving wood 2×3¼×7½".

**Carving tools**

**Gouges:**

¼" no. 5 . . . . . ⌣

⅛" no. 9 . . . . . ⌣

¼" no. 9 . . . . . ⌣

1/16" no.11 U-veiner . . ⌣

⅛" no.11 U-veiner . . . ⌣

**V-tool:**

⅛" no. 12 . . . . . V

**Knife:** Bench knife.

**More and more carvers seem to like fish these days. Not necessarily on the dinner table, but as carving subjects. Try your hand at this realistic bluegill, and discover the lure of aquatic carving.**

Transfer the full-sized fish body side-view and top-view patterns in the *WOOD PATTERNS™* insert in the middle of the magazine onto a 2×3¼×7½" piece of basswood. Here's how carver and project designer Bill Payne of Broken Arrow, Oklahoma, does it quickly and accurately. First, he pastes a photocopy of each pattern to a piece of light cardboard, such as a cereal-box side. Then, he cuts out the pattern to create a cardboard template. He then lays the template on the stock and traces around it with a sharp pencil.

Bandsaw the side-view outline. Reattach the cutaway parts to the blank with masking tape, and bandsaw the top-view outline. Save the waste pieces to cut the fins from later.

### Give it a slippery shape

Smooth the body, using abrasives or gouges, a knife, and shaves. Remove all saw marks, and round the corners to give your fish a smooth, sleek form.

Mark the eye location on each side of the head. Glass eyes look realistic and are easy to install. (Use 10mm fish eyes, available from many carving-supply dealers.) Or if you prefer, you can

Print this article

carve the eyes. If you plan to use glass eyes, drill about ⅜" deep with a ½" brad-point bit at each mark. (The oversized holes enable you to position the eyes later by setting them in putty.)

Sketch the end-view curve of the caudal fin, or tail fin, as we'll call it, onto the end of the bandsawn fish. Then, rough the curled tail fin, starting about 1¾" from the tail end of the sawn blank. Carve the fin itself to about 3/16" thick.

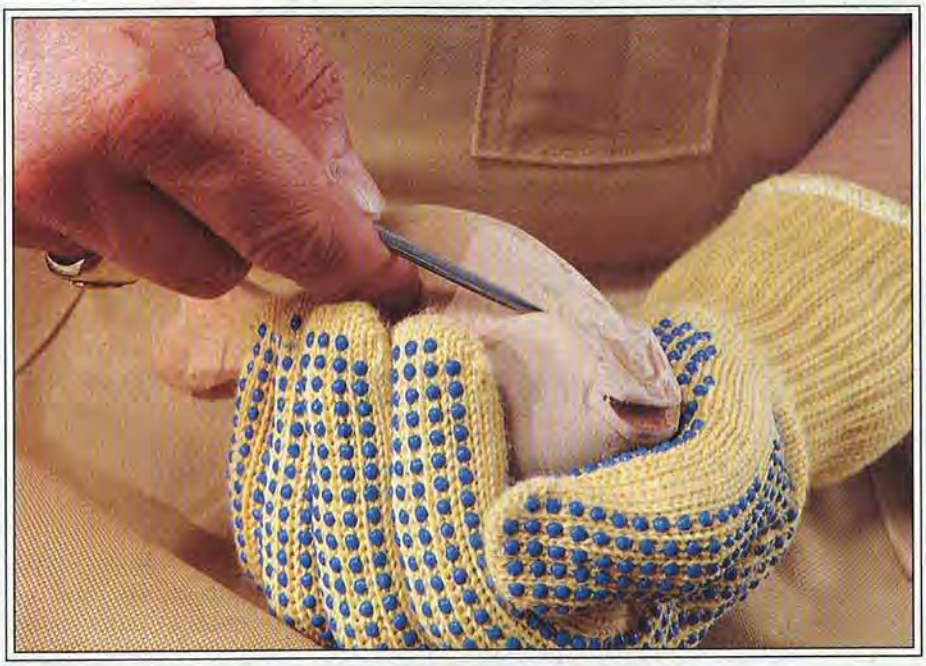
Refer to the photographs of the finished carving, then sketch rib lines along the tail fin. Space them so they're about ¼" apart at the end of the fin, a bit closer where the fin joins the body.

With a no. 9 gouge or no. 11 U-veiner about ¼" wide, carve from the base of the fin straight out to the edge between each pair of lines. Make shallow cuts to begin, first on one side of the fin, then on the other. Deepen the hollows until the fin is a little less than ⅛" thick at the trailing edge.

Draw the gill line and ear on each side. Stop-cut the gill lines. (A stop cut is simply an incision along the pattern line, made with a knife or gouge. It allows you to cut right to the pattern line without splitting off wood beyond it.)

Now, shape the gill area. From about ¾" behind the gill line, carve toward it, establishing a relief behind the line of about 1/16". Working down from the top of the gill line—adjacent to the ear, gradually deepen the relief so it tapers from 1/16" at the top to 5/16" at the bottom. To represent the gill cover, undercut the line about ⅛" with a small U-veiner or knife, forming a flap as shown *above right*. Make it ⅛" thick or less at the trailing edge.

Refer to the detail photo on *page 76* as you carve the lower part of the head and the portion of the body beneath the flap. With a small gouge, slightly cut away the side of the head to create the bulging area around the eye and onto the cheek. If you've opted to carve the eyes, draw a ⅜" circle at each eye location. With the tip of your knife, carve a slightly flattened spherical section inside the circle. Remove wood from, or relieve, the surrounding surface slightly so the eye will appear to be standing out from the side of the head. With a small V-tool, carve the maxillary line.



**Undercut the gill covers easily with a 1/16"-wide no. 11 U-veiner.**

## Fashion the fins

Saw the waste pieces into stock for the fins. You'll need one piece ⅞×3½×1¼" for the dorsal fin, one ¼×2¼×1¼" for the ventral fin, and four ⅜×1×2" for the two pectoral and two pelvic fins. Trace the fin patterns onto the blanks.

The uncurled ventral fin is the easiest to carve, so start with that one. Cut around the pattern line with a coping saw or scrollsaw. Then, with a shallow gouge, taper the fin from about 3/16" thick at the base (where the mounting tab is located) to ⅛" or less at the outer edge. In general, thinner fins will look more realistic.

Next, carve the ribs in the fin. Refer to the photographs, then sketch guidelines on both sides of the blank. Carve the ribs and grooves as you did on the tail fin. Gradually deepen the grooves until the thickness at the bottom of the grooves along the edge of the fin is about 1/32".

Cut out the pelvic and pectoral fins. Refer to the cross-section view with the pattern, then carve a hollow running along the grain. Shape the back of the fin in a curve to match the hollow, creating a crescent-like cross-section about ⅛" thick at the center. Be sure to carve one curving toward each side so you'll have left and right fins. Raise ribs on these fins with the ⅛" V-tool.

For the compound-curved dorsal fin, cut out the pattern outline. Then, referring to the top and bottom views accompanying the pattern, sketch the top and bottom lines on the edges of the cut-out fin. With your gouge, carve out the front contour. Cut down to the lines on the edge, creating a curved surface between them.

*Continued*

Give the form a natural-looking ripple to make it look as if it is moving through the water.

Carve the back surface to match, forming a fin about ⅛" thick. With the no. 9 gouge or U-veiner, form the ribs and hollows as you did for the ventral fin.

Now, fit the fins to the body. Hold each fin in position, and mark the location for the slot that will receive the fin tab. Carve the slots with a knife, angling the ones for the pectoral and pelvic fins so the fins will stand away from the body at about 45°. Sand or carve the mating surface of each fin to fit the body. Don't glue the fins into place, however.

## Work on a wet fish

A series of gouge cuts represents the fish's scales. But before you begin carving them, wet the fish under running water—the kitchen-sink sprayer does a fine job. Then, wrap the carving in a damp towel and let it sit for two hours or so. Dampening the wood this way prevents the scales from flaking off as you carve.

Carve the scales with a deep gouge, such as a no. 9 or 11, about ⅛" wide. Keep the open side of the gouge toward the front of the fish so the rounded end of the carved scales will point toward the back.

Start carving the scales at the mouth. Angle the gouge into the wood at about a 45° angle, as shown *opposite page bottom*. Push it in about 1/16", raising a rounded flap of wood. Cut another right next to that one, and so forth until you've completed a row all around the body.

For the next row, place the cutting edge about a gouge width toward the back of the fish and midway between two scales. Offsetting them like this will create the effect of overlapping layers, like roof shingles. Carve the row as before, then start another one, again offsetting it by ½ a scale's width. Rewet the body as you work, if necessary.

Cover the entire body with scales, but not the tail. Remember to orient the scales so that water flowing along the fish's body would smooth them down, not ruffle them up.

Let the carving dry. Sand lightly in the direction the scales lie—just enough to remove fuzz raised by wetting the carving. A Scotch Brite pad works well for defuzzing the carving.

## Take care of some details

Now, add the fins and, if you haven't already carved them, the eyes. Glue the dorsal and ventral fins into position, then the pelvic and pectoral ones. Fill any gaps between the fins and the body with wood putty, and allow to dry. Sand the filled areas smooth.

To set a glass eye, fill the drilled eye hole with putty. While that's still soft, push the eye into place, with the lobe on the pupil to the front. Blend the putty that squeezes out around the eye into the eye bulge in the head. After the putty dries, carve and sand the eye area to form the eyelid. After setting the eyes, mask them to protect them during painting.

On the left side of the fish near the tail, drill a hole about ¼" deep to fit a ¼" dowel. Glue a 4-6" length of dowel into the hole. Later, you'll shorten this to attach the fish to the display stand. For now, however, it makes a convenient handle for painting the fish.

## Bring color to your bluegill

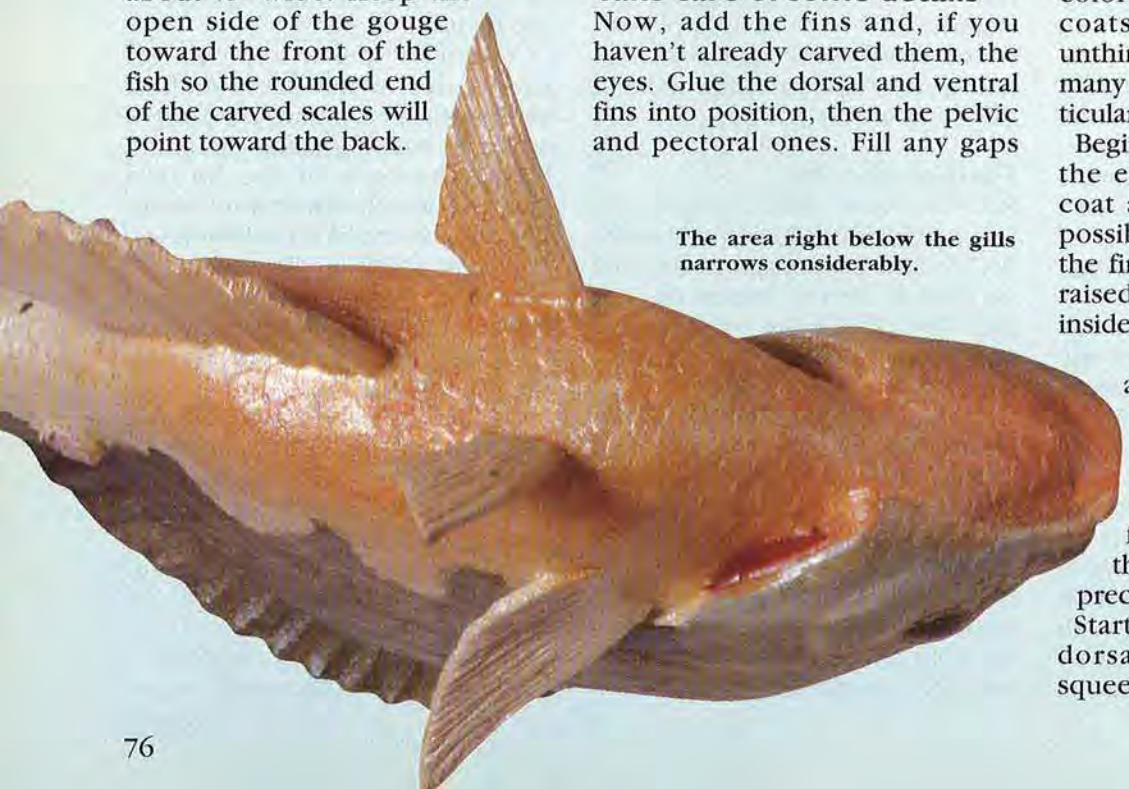
Paint the fish with acrylic artist's colors, available from art-, crafts-, or carving-supply dealers. You'll need black, white, red, orange, avocado, and a light blue.

When painting the fish, thin your paint with water or acrylic medium to the approximate consistency of milk. Then, build the color by applying multiple thin coats. A single, heavy coat of unthinned paint would obliterate many carefully carved details, particularly the scales.

Begin with a coat of white over the entire fish. Apply this base coat as smoothly and evenly as possible. Paint along the ribs on the fins, and be sure to cover the raised edges of each scale. Paint inside the mouth and gill areas.

Refer to the photographs as you add color to the fish. Consult other references, too, to learn more about the fish's coloration. Colors can vary widely from one fish to another in the same species, so hitting a precise shade isn't crucial.

Start painting on the back and dorsal fin. Mix the color by squeezing a bit of avocado onto



**The area right below the gills narrows considerably.**

your palette and mixing a small amount of black into it. (A plastic snap-on coffee-can lid makes a perfect palette.) Mix the colors well to prevent a marbling effect.

Hold the fish upside down, and start painting the two stripes on the side. Work onto the back and dorsal fin, adding more coats of the color wash until you reach the color you want. For a natural appearance, mix several slight variations of the color, then blend them together on the body. You can force-dry the paint between coats with a hair dryer if you want to speed things up.

Next, color the underside orange. The color is more intense in the isthmus (the area that would be the fish's chin), fading toward the back of the fish and on the sides. Apply additional coats under the throat for the brighter color. Blend the orange into the white around the edges.

Add the blue that gives the fish its name over the gills. Here again, the color is more intense at the front, fading toward the back. Paint a red stripe inside the gills. Color the inside the of the mouth orange and the ear gray.

**Give the dorsal fin, on the fish's back, a slight ripple along the edge. Make the fins thin.**

Protect the paint job with clear lacquer. Or, for a realistically fishy-looking piece, spray the painted carving with a pearl glaze coat. (We used Folk Art pearl glaze no. 782, available from craft-supply dealers. It mutes the paint somewhat, so apply a light coat.)

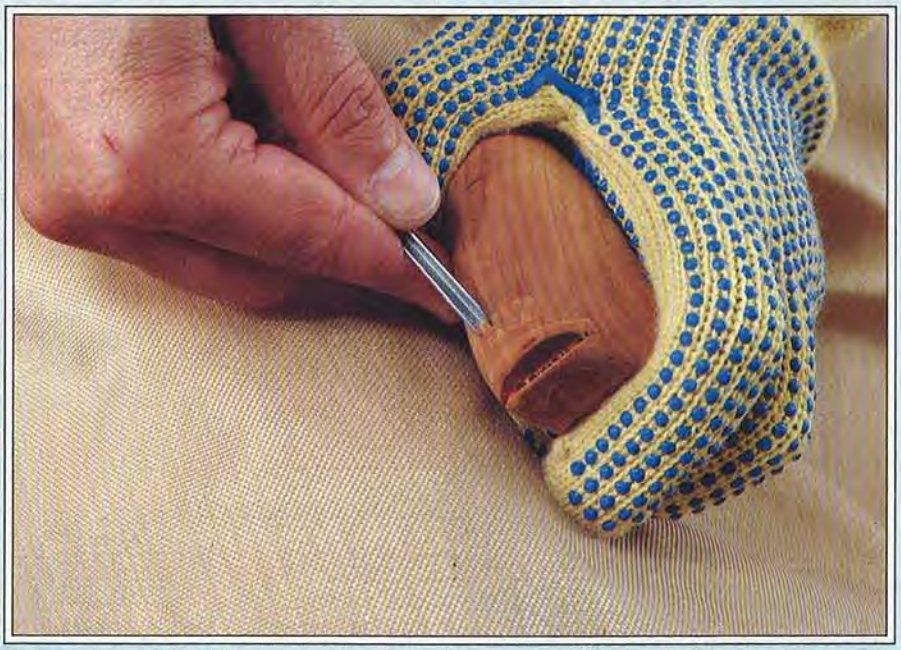
## Mount your fish on a twig

To make a display stand like the one shown in the opening photo, find a piece of driftwood or a twig about ½" in diameter with a straight section about 5" long. If you use a twig, peel off the bark and sand the bare wood smooth to give it a driftwood look.

In a piece of carving wood about 1×3×5", drill a hole for the twig at a 30° angle to the left, 1½" from the right end and 1" from the back edge. Carve the top surface and edges to represent a section of a streambed. (The one shown was carved to a roughly oval shape to fit on a 4×6" oval base.) Keep the bottom flat.

Brush woodworker's glue over the surface and edges, and pour sand all over the carved stand. After the glue dries, brush off the loose sand. Fit the driftwood into the hole without gluing.

Hold the fish up to the stand to determine the location for the fish-mounting hole in the driftwood. Drill a ¼" hole as deep as possible into the driftwood. Saw off the fish's mounting dowel to the depth of the hole plus ¼". This will stand the fish off from the driftwood by about ¼" when the dowel is fully inserted into the hole. Glue the driftwood into the stand, and the fish to the driftwood. Sign and date the carving on the bottom of the stand.



**Dampen the fish before carving the scales. A ⅛"-wide no. 11 U-veiner forms the scales neatly. Overlap the scales shingle-style as you work from front to back.**

Project Design: © W. L. Payne
Illustrations: Kim Downing
Photographs: John Hetherington; King Au

# ASK WOOD

**Whether your woodworker's license reads "Beginner," "Intermediate," or "Advanced," you're bound to have a few questions about your favorite hobby. We can help by consulting our staff and outside experts. Send your questions to Ask *WOOD*®, *Better Homes and Gardens*® *WOOD* Magazine, 1912 Grand Ave., Des Moines, IA 50309-3379. *CompuServe* address: 74404,3516 (or) Internet: 74404.3516@compuserve.com**

## Looking for more information on moldings and wood movement

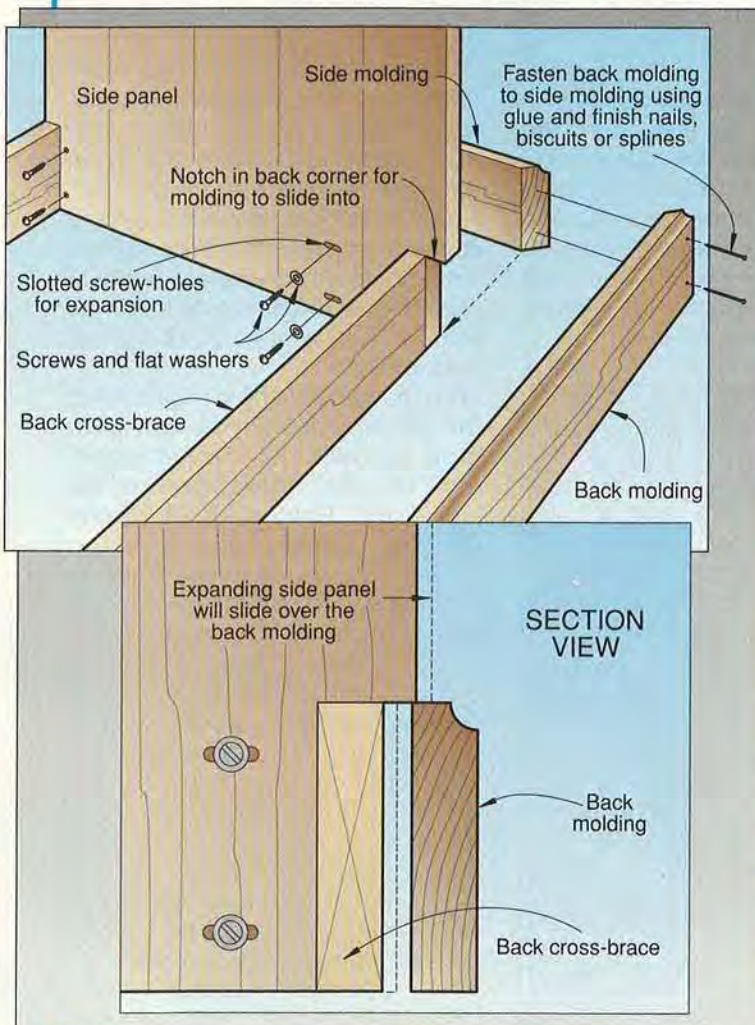
*I want to fasten trim moldings on all sides around the top and the bottom of my solid-maple chest of drawers. How can I do this and still make allowance for wood movement?*

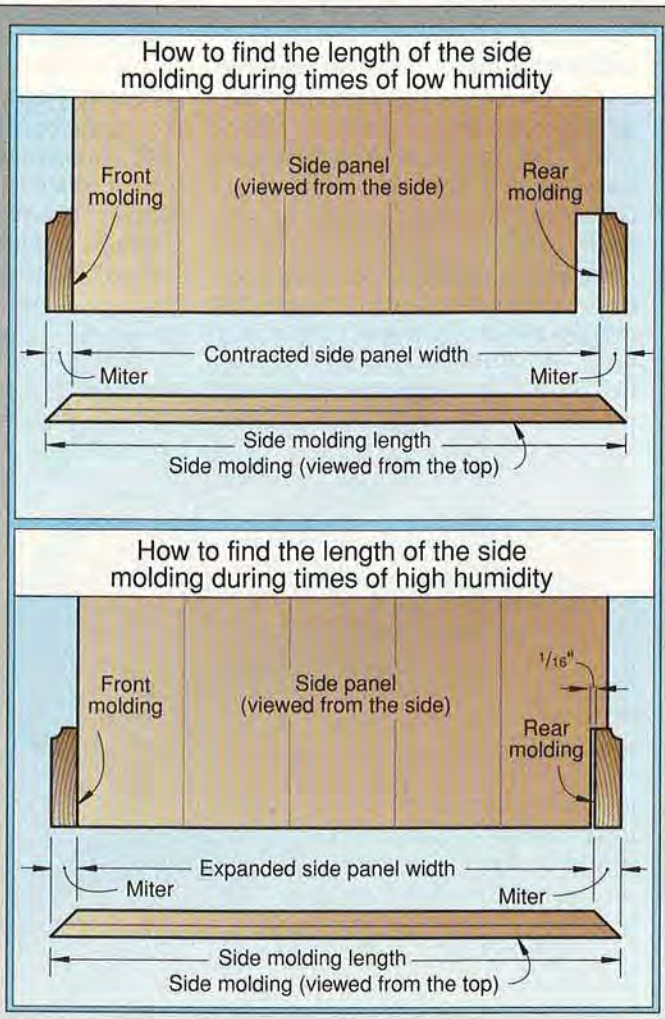
***—Bill Ledgerwood, Hot Springs Village, Ark.***

Bill, as we mentioned in the February 1994 Ask *WOOD* "The Joint is Open," the sides of this chest will change in dimension as much as ⅛" per foot of width due to humidity variations over a year's time. To cope with this movement, we suggest you use a sliding-type joint to fasten the back of the cross-grain side moldings, as described in the above-mentioned article, and add an expansion-allowance notch on the back edges of the side panel, as shown in the drawings, *below*.

Then, fasten the rear molding solidly to the back miters of the side moldings with glue and finishing nails, biscuits, or splines. The expansion-allowance notch will permit the back edge of the case sides to slide over the top of the rear molding as they expand, without breaking loose the miter joints.

Where you measure the side-molding length depends on the relative humidity level at the time you take the measurement. During the winter or other times of low humidity, determine the inside length of the side molding by measuring the full width of the sides, above the notch (see drawing *below*). In times of high humidity, measure from the lower-front corner of the cabinet side to 1/16" beyond the vertical edge of the expansion-allowance notch (see drawing *bottom*).


Side panel
Side molding
Fasten back molding to side molding using glue and finish nails, biscuits or splines
Notch in back corner for molding to slide into
Slotted screw-holes for expansion
Screws and flat washers
Back cross-brace
Back molding
Expanding side panel will slide over the back molding
SECTION VIEW
Back molding
Back cross-brace


How to find the length of the side molding during times of low humidity
Front molding
Side panel (viewed from the side)
Rear molding
Contracted side panel width
Miter
Miter
Side molding length
Side molding (viewed from the top)
How to find the length of the side molding during times of high humidity
Front molding
Side panel (viewed from the side)
1/16"
Rear molding
Expanded side panel width
Miter
Miter
Side molding length
Side molding (viewed from the top)

## Router bit arbor comes up short

*I have been using a slot-cutter bit mounted in the router on my router table to cut ¼" slots in the middle of 1½"-thick wood. I am finding that raising the slot cutter to the height I need leaves only about ½" of the router-bit shank remaining in the collet. I was taught to insert the shank to the bottom of the collet, and then raise it 1/16" before tightening. I am concerned that the bit may work itself loose while cutting with my current setup. What can I do to make this safer?*

***—Robert N. Goldsmit, Bellefontaine, Ohio***

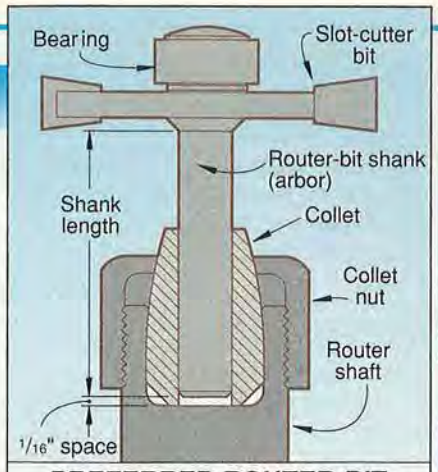
Bob, you are correct in believing that router bits should be set deep into the collet to keep them from working loose during operation. And yes, we do have some ideas that may help.

First, remove the router from the table, and operate the tool freehand, using the slot-cutter's bearing as a guide. Many router table mountings are thicker than the router base plate, so this often will allow you to fit more of the router-bit shank in the collet.

Second, many slot-cutter bits are available as two parts, the slot cutter and the mounting shaft or arbor. For the smoothest cut, use a slot-cutter arbor with a ½"-diameter shank. These arbors provide more surface area for the router collet to grip, they will flex less, and consequently, vibrate less than the thinner arbors.

We recommend you compare the length of the shank on the router-bit arbors listed in our advertisers' catalogs, and buy the cutter and its corresponding arbor that best meets your needs. The longest-shanked slot-cutter arbor we found in our catalog library comes from Eagle America, P.O. Box 1099, Chardon, OH 44024, (call 800/872-2511). This arbor has a ½ × 1¾" shank, with a 5/16" spindle diameter, part #197-8305, and priced at $6.99 plus shipping. The ¼" three-wing slot cutter to fit this arbor, part #146-1030, is priced at $11.99 plus shipping.

*Continued on page 80*




**PREFERRED ROUTER-BIT PLACEMENT IN COLLET**

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# ASK WOOD

*Continued from page 79*

## A neat way to build a staved wishing well

*I want to build an outdoor wishing well, about 3' in diameter. How can I figure out the necessary number of staves and the angle for ripping them?*

***Bob Myers, McClellandtown, Pa.***

The first thing to find out, Bob, is the circumference or measurement around the outside of the wishing well. To get this figure, multiply the diameter of the well (36") by a number known as Pi ($\pi$) calculated to be 3.1416. Here's the formula:

Circumference = 36" × 3.1416 = 113.1"

Then, to find the number of staves, divide the circumference by the width of the wood you plan to use. We chose the width of a 1 × 4, or about 3½":

113.1" ÷ 3.5" = 32.3

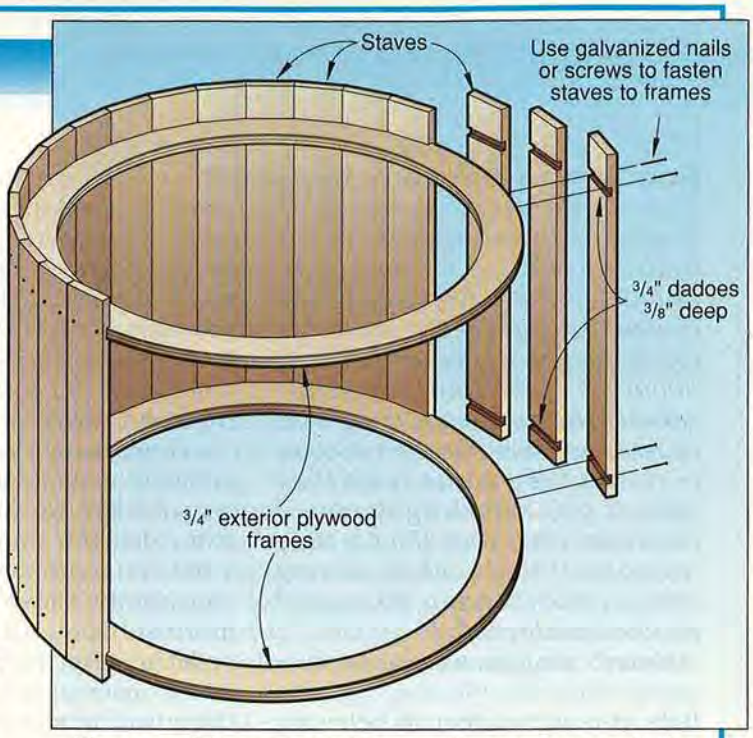
Because we don't want a partial stave, round this answer up to 33, and divide the circumference by this number to get the final stave width:

113.1" ÷ 33 = 3.427", or about 3 7/16"

To determine the bevel ripping angle, first divide the degrees in a circle (360°) by the number of staves (33), and then divide this answer by 2:

360 ÷ 33 = 10.91  10.91 ÷ 2 = 5.46

Set your tablesaw to rip a bevel just under 5½°.




To assemble your wishing well, screw or nail the staves to two 35¼" outside diameter frames made from ¾" exterior plywood (as shown *above*). Fit the frames into dadoes cut 1" from the top and bottom of the inside faces of the staves.

*Continued on page 83*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# ASK WOOD

*Continued from page 80*

## Bubbles make for toil and trouble

*I am having a problem with bubbles appearing on the surface of my finished work. I use water-based polyurethane over a stain and a sanding sealer. I am careful to stir both the sanding sealer and the finish, and I apply both the sealer and the final coat with a foam brush. Can you tell me what causes the bubbles?*

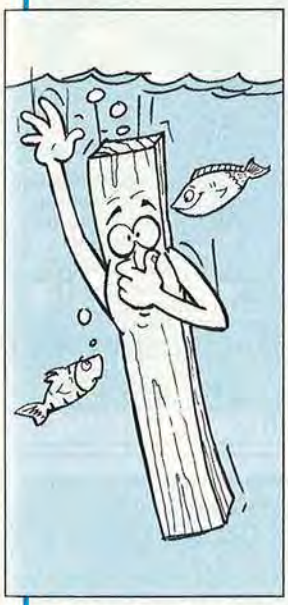
***—Ronald W. Ray, San Jose, Calif.***

We think we can, Ron. You have done most of the steps necessary to prevent bubbles from forming in a water-based finish. However, we suspect the foam-type brush caused the bubbles. Apply water-based finishes with a high-quality, clean, nylon or polyester brush. Dip this brush no more than 1" into the finish, and spread it onto the wood in smooth, even strokes.

## Hard as ironwood (and harder)

*Which wood is harder, lignum vitae or ironwood?*

***—Betty Boggs, Trumansburg, N.Y.***



Betty, our vote goes to lignum vitae, which hails from the West Indies and Central America. It's also heavier than ironwood. Lignum vitae weighs about 84 pounds per cubic foot, twice as much as oak. In fact, this stuff is so heavy that it won't even float in water. Now that's heavy!

Because of its hardness and waxy texture, lignum vitae has been used for ship propeller shaft bushings, machinery bearing blocks, and pulley sheaves. Wood carvers will be most familiar with lignum vitae as the dense, heavy wood used to make carving mallets.

The word "ironwood" refers to several species of trees, usually the hardest wood in a given area. In New England, ironwood describes American hornbeam or blue beech. In Texas, honey mesquite earns the name of ironwood. In fact, most areas of the world have a specific tree referred to as "ironwood", some of which have weights approaching that of lignum vitae. However, because of slow growth and small log size, very few of these woods are commercially available. Those ironwoods that are harvested usually end up being used in their vicinity as flooring, bearings, rollers, and tool handles.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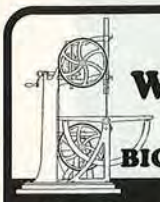
# Woodworker's Marketplace

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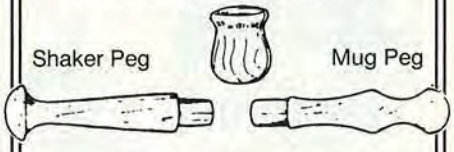


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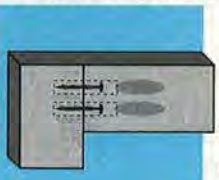

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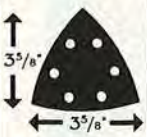


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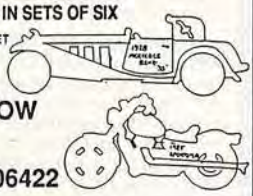

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WOODWORKER'S RESOURCE



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WOOD magazine's IDEA SHOP 2

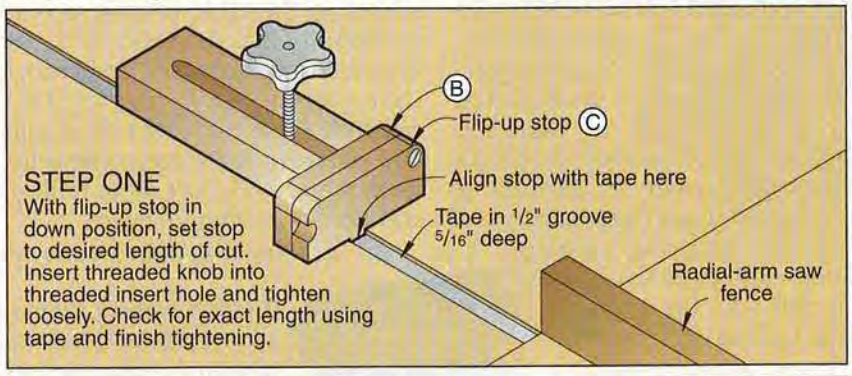
# HOW TO USE THE RADIAL-ARM STOP

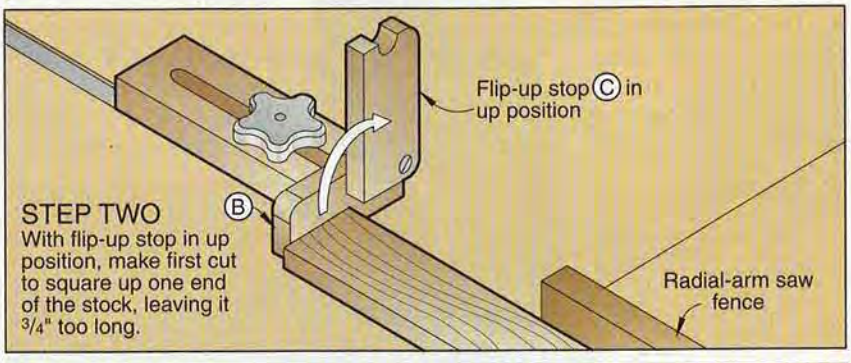
*Continued from page 45*

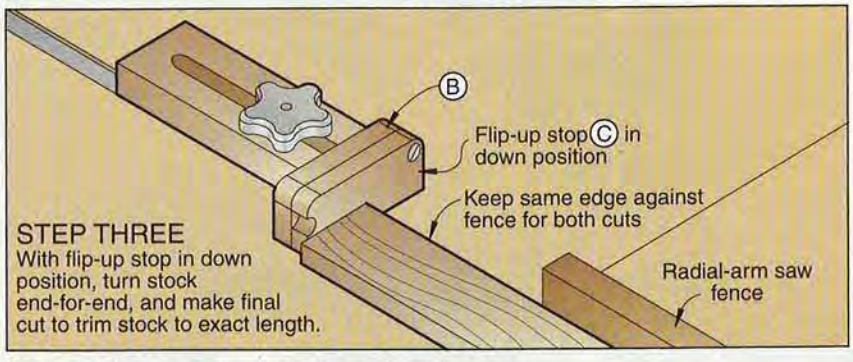
As shown in Step One of the three-step drawing *below*, position the assembled stop in the groove machined in the laminated top, aligning the outside face of part (C) with the desired length on the measuring tape. Secure the stop to the laminated top by tightening the knob.

When cutting boards to length, we often cut both ends of the board to ensure square ends. To do this using the stop, lift the flip-up stop (C) as shown in Step Two, position the end of the piece being cut against the support (B), and crosscut the opposite end to length (causing the board to be ¾" too long). Next, as shown in Step Three, turn the board end for end, lower the flip-up stop (C), and cut the other end of the board to the exact length.

***Note**: After changing saw blades, loosen the panhead screw in the adjustment slot in the aluminum bar, and adjust the bar stock if necessary to ensure an accurate cutting.*


B
Flip-up stop C
Align stop with tape here
Tape in 1/2" groove 5/16" deep
Radial-arm saw fence
STEP ONE
With flip-up stop in down position, set stop to desired length of cut. Insert threaded knob into threaded insert hole and tighten loosely. Check for exact length using tape and finish tightening.


Flip-up stop C in up position
B
Radial-arm saw fence
STEP TWO
With flip-up stop in up position, make first cut to square up one end of the stock, leaving it 3/4" too long.


B
Flip-up stop C in down position
Keep same edge against fence for both cuts
Radial-arm saw fence
STEP THREE
With flip-up stop in down position, turn stock end-for-end, and make final cut to trim stock to exact length.

Written by Marlen Kemmet  Project Design: James R. Downing
Illustrations: Jamie Downing, Lorna Johnson  Photographs: John Hetherington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Circle No. 1285

## This kit helps you rout rabbets of various widths

In the past, if you wanted to rout a rabbet you had to have a bit with cutters that matched the exact width of the rabbet. With this CMT Rabbet-Master Kit, however, you simply loosen the set screw on the bottom of the shaft, slip one bearing off and the other on, and tighten the set screw.

The kit comes with a two-flute carbide-tipped rabbet bit, an allen wrench, and six pilot bearings—four steel bearings and two with plastic rims. Depending on which bearing you use, you can rout rabbets with widths of ⅛", ¼", 5/16", ⅜", 7/16", and ½".

I found changing the bearings easy and fast, and the accuracy of the cuts turned out right on the money. What makes this kit even more valuable was that I could put these same bearings on a number of other piloted router bits—coves, chamfers, roundovers, and such—and change those profiles too.

***—Tested by Chuck Hedlund***

*Rabbet-Master Kit, ½" shank, model 800-623, $40.90 ppd.; ¼" shank, model 800-622, $37.90 ppd., from CMT Tools, 310 Mears Blvd., Oldsmar, FL 34677. Call 800/531-5559.*

## Multi-function machine makes sanding easier

I hate sanding! And if you feel the same way, take a look at the new Delta Sanding Center. Powered by a 1.5-hp motor, this machine works as a belt and disc sander. What's more, a power take-off spindle opposite the disc sander accepts a number of different accessories including pneumatic drum sanders, buffing wheels, abrasive flap wheels, and a flexible-shaft drive.

The 6×48" belt sander tilts from fully upright to fully horizontal, and a cast-iron platen minimizes heat build up. The tilting cast-iron table dedicated to the belt sander helps you to sand bevels and miters. A removable backstop prevents the workpiece from being carried along with the belt. For sanding inside curves, you can take off the cover on the end of the belt and work freehand.

The 12" disc sander also comes with a cast-iron table that tilts 45° up or down from horizontal. But my favorite component is the sliding pivot pin that travels in the miter slot of the disc-sander table. The pivot pin and the large table (13×16") enable you to sand perfect circles up to 24" in diameter. You can also buy an accessory extension arm to sand circles up to 48".

Dust from the disc and belt sanders is collected through a 4" port underneath the base of the machine. An optional plastic basin can be mounted under the accessory spindle to trap the dust from the accessory sanding tools.

In terms of performance, I found the belt tensioning and tracking simple to adjust. The tables rotate smoothly and lock securely, the scales on the table trunnions read easily and accurately, and the induction motor delivers more than adequate power. This machine gave me accurate results and provides some welcome relief from woodworking's most tedious and time-consuming chore.

***—Tested by Dave Henderson***

*Delta Sanding Center, about $800, at Delta dealers nationwide, or contact Delta International Machinery Corp., 246 Alpha Dr., Pittsburgh, PA 15238. Call 800/438-2486.*

*Continued on page 96*

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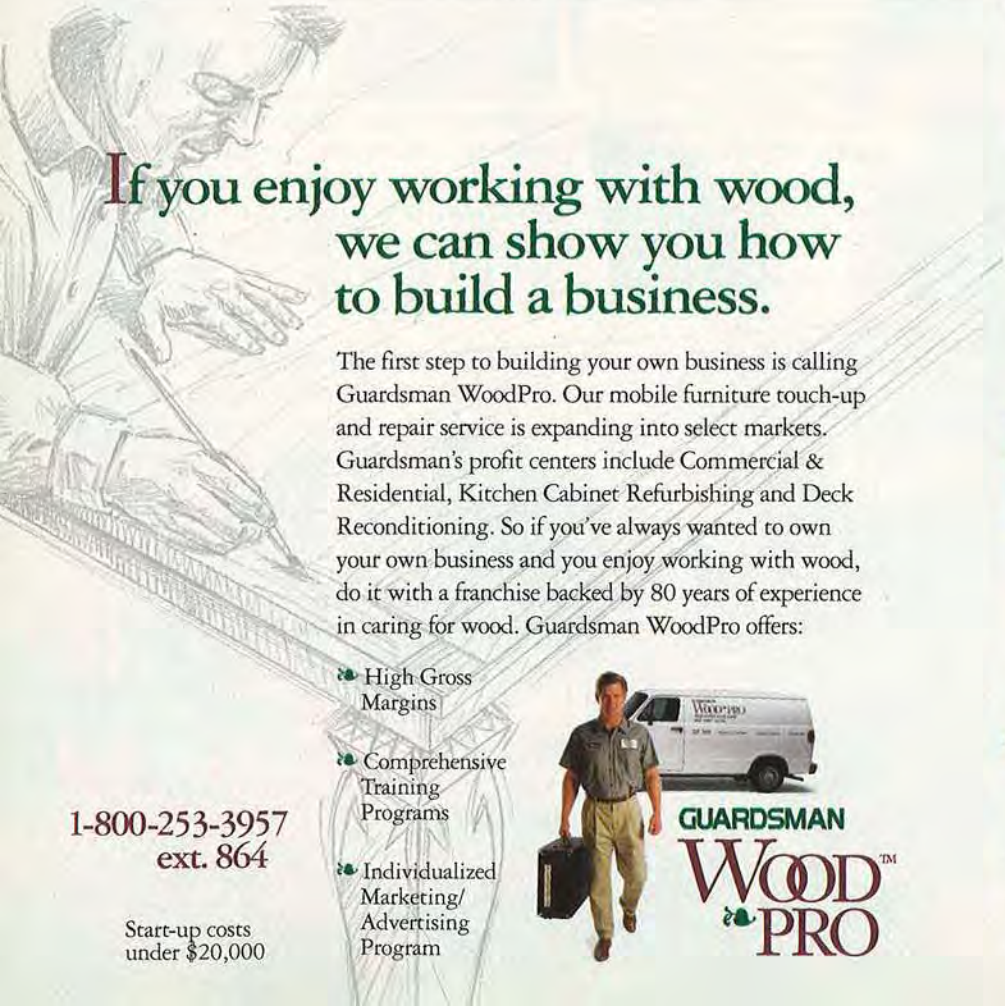

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## PRODUCTS THAT PERFORM

SHOP TESTED

*Continued from page 94*

### Get into the groove with this rubber sanding grip

Hand sanding seems simple, but it's easy to screw up if you sand curved profiles with just your fingers behind the paper. The uneven pressure can sand away too much material in one area, or leave another area barely touched.

With the Curve-A-Flex Sanding Grip, you wrap a half-sheet (5½×9") of sandpaper around the grip, bend it into the profile you need, and sand. When you've worn the paper out, simply discard it and put on a fresh sheet. The grip is made from a durable rubber that holds the sandpaper firmly in place.

In my tests, I got great results using the Curve-A-Flex. It's stiff enough to enable you to bear down, and yet it's easily bent into small-or large-profile curves. I also found it comfortable to use because I was applying pressure with my palm instead of my fingers. If you sand curved profiles on wood and want good results, I recommend this helpful tool.

***—Tested by Bob McFarlin***

*Curve-A-Flex Sanding Grip, about $10 in catalogs and stores, or contact A.L.L. Building Materials Corp., 1606 Hamner Ave., Norco, CA 91760. Call 800/772-6346.*

*Continued on page 98*

## PORTER-CABLE

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| 312 | PRODUCTION OFFSET LAMNT TRIMMR | 158 |
| 314 | 4 1/2" TRIM SAW | 135 |
| 315-1 | 7 1/4" BUILDERS SAW | 117 |
| 330 | SPEED BLOCK FINISHING SANDER | 60 |
| 330K | 330 WITH CASE & 2-10 YD ROLLS PAPER | 94 |
| 332 | QUIKSAND 5" RNDM ORB W/STIKIT PAD | 66 |
| 332K | 332 W/CASE & 100 SHEETS PAPER | 92 |
| 333 | QUIKSAND W/HOOK & LOOP, DUSTLS | 73 |
| 333K | 333 W/CASE & 50 SHEETS PAPER | 99 |
| 334 | QUIKSAND W/STIKIT, DUSTLESS | 73 |
| 334K | 334 W/CASE & 100 SHEETS PAPER | 99 |
| 340 | 1/4 SHT FIN SANDER W/DUST P/U | 49 |
| 340K | 340 WITH CASE & 10 SHEETS PAPER | 72 |
| 345 | SAW BOSS 6" CIRCULAR SAW | 104 |
| 347 | 7 1/4" FRAMERS SAW 15 AMP, 10.25 LBS | 127 |
| 351 | 3" X 21" BELT SANDER | 148 |
| 351K | 351 W/ 10 ASST BELTS & BELT CLNR | 158 |
| 352 | 3" X 21" BELT SANDER W/DUST BAG | 151 |
| 352K | 352 W/10 ASST BELTS & BELT CLEANER | 161 |
| 9352VS | 3" X 21" VS DSTLS BELT SANDR W/CSE | 165 |
| 9352VSK | 9352VS W/10 ASST BELTS & BELT CLNR | 175 |
| 360 | 3" X 24" BELT SANDER W/DUST BAG | 189 |
| 360K | 360 W/10 ASSORTED BELTS & BELT CLNR | 200 |
| 361 | 3" X 24" BELT SANDER | 182 |
| 361K | 361 W/10 ASST BELTS & BELT CLEANER | 193 |
| 362 | 4" X 24" BELT SANDER W/DUST BAG | 195 |
| 362K | 362 W/10 ASST BELTS & BELT CLEANER | 208 |
| 363 | 4" X 24" BELT SANDER | 191 |
| 363K | 363 W/10 ASST BELTS & BELT CLEANER | 204 |
| 410 | UNDERSCRIBE LAMINATE TRIMMER | 148 |
| 411 | MITER FOLD LAMINATE TRIMMER | 165 |
| 447 | 7 1/4" FRAMERS SAW W/BRAKE 15 AMP | 137 |
| 505 | 1/2 SHT FIN SANDER | 123 |
| 505K | 505 W/CASE & 2-10 YD ROLLS PAPER | 159 |
| 511 | CYLINDRICAL LOCK INSTALLATION KIT | 139 |
| 550 | *NEW POCKET CUTTER* | 178 |
| 556 | BISC JOINER W/CASE & TILT FENCE | 138 |
| 556K | SAME AS ABOVE W/1000 BISCUITS | 160 |
| 690 | 1 1/2 HP ROUTER W/1/4" & 1/2" COLLETS | 132 |
| 690K | 690 W/CS, EDGE GUIDE, & TEMP GD KIT | 179 |
| 9690 | 1 1/2 HP ROUTER W/CASE | 144 |
| 691 | 1 1/2 HP "D" HANDLE ROUTER | 148 |
| 691K | 691 W/CASE, EDGE GD & TEMP GD KIT | 204 |
| 693 | PLUNGE BASE ROUTER, 1 1/2 HP | 169 |
| 695 | SHAPER TABLE W/ 1 1/2 HP ROUTER | 216 |
| 696 | SHAPER TABLE | 128 |
| 743 | 7 1/4" FRAME SAW, 15 AMPS | 128 |
| 843 | 7 1/4" FRAME SAW, 15 AMPS | 138 |
| 2620 | 3/8" VSR DRILL, 0-1200 RPM W/CHK | 88 |
| 2621 | 3/8" VSR DRILL, 0-1200 RPM. KEYLESS | 89 |
| 5008 | DOVETAIL TEMPLATE | 78 |
| 5009 | MORTISE & TENON JIG | 47 |
| 5116 | OMNI JIG | 253 |
| 6931 | PLUNGE ROUTER BASE | 73 |
| 7116 | *NEW 24" OMNIJIG* | 293 |
| 7310 | LAMINATE TRIMMER, 5.6 AMP | 88 |
| 7312 | OFFSET TRIMMER | 127 |
| 7319 | TILT BASE TRIMMER | 99 |
| 97335 | 5" RANDOM ORBIT SANDER, VS W/CSE | 132 |
| 7335K | 7335 W/CS, DUST EX SYS, 100 SHTS PPR | 165 |
| 97336 | 6" RANDOM ORBIT SANDER, VS W/CSE | 137 |
| 7336K | 7336 W/CS, DUST EX SYS, 100 SHTS PPR | 169 |
| 73333 | RANDOM ORBIT DUST EXTRACTION | 24 |
| 7518 | 3 1/4 HP FIXED BASE ROUTER-5 SPEED | 267 |
| 7519 | 3 1/4 HP FIXED BASE ROUTER-1 SP | 233 |
| 7536 | 2 1/2 HP FIXED BASE ROUTER | 202 |
| 7537 | 2 1/2 HP FIXED BASE "D" HNDL RTR | 208 |
| 7538 | 3 1/4 HP PLUNGE ROUTER-1 SPEED | 235 |
| 7539 | 3 1/4 HP PLUNGE ROUTER-5 SPEED | 269 |
| 7549 | TOP HANDLE BAYONET SAW | 134 |
| 7549K | 7549 W/CASE & 10 BLADES | 152 |
| 7649 | BARREL GRIP BAYONET SAW | 147 |
| 7700 | *NEW 10" LASERLOC MITER SAW* | 338 |
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| 7810 | POWER TOOL TRIGGERED WET/DRY VAC | 252 |
| 9118 | PORTA PLANE KIT W/CASE, CRBD BLD | 209 |
| 9314 | 4 1/2" TRIM SAW KIT | 152 |
| 9315 | 7 1/4" BUILDERS SAW KIT | 139 |
| 9345 | SAW BOSS 6" CIRCULAR SAW KIT | 123 |
| 9347 | 7 1/4" FRAMERS' SAW W/STEEL CASE | 138 |
| 9637 | TIGER SAW VAR SPD RECIP SAW KIT | 144 |
| 9647 | TIGER CUB RECIP SAW KIT | 119 |
| 9743 | 7 1/4" FRAME SAW KIT, 15 AMPS | 140 |
| 9853S | 12V CRDLS KIT W/2 BAT, CASE | 169 |
| 97310 | LAMNT TRIMMR KIT W/4 BASES & CS | 194 |

## AEG

| | | |
|---|---|---|
| TXE150 | 6" VS DSTLS RANDOM ORBIT SANDER | 138 |
| BSPE100 | BAREL GRIP JIG SAW, VS W/CASE | 155 |
| FSPE100 | TOP HANDLE JIG SAW, VS W/CASE | 155 |
| HBSE75S | 3" X 21" BELT SANDER, VAR SPEED | 174 |
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| 31-050 | 1" BELT SANDER | 74 |
| 31-080 | 1" BELT/5" DISC SANDER | 88 |
| 31-460 | 4" BELT/6" DISC SANDER | 127 |
| 34-182 | TENONING JIG | 84 |
| 36-090 | 10" SIDEKICK MITER SAW | 219 |
| 37-070 | *NEW* 6" VS BENCH JOINTER | 258 |
| 40-560 | 16" SCROLL SAW, 2 SPEED | 184 |

## Milwaukee

| | | |
|---|---|---|
| 0407-1 | 12V KYLS CDLS DRILL KIT W/2 BAT, CS | 179 |
| 6490 | 10" MITER SAWE | 264 |
| 6494 | 10" COMPND MITERSAW W/CARB BLD | 322 |
| 6507 | VAR SPEED SAWZALL W/BLADES & CSE | 145 |
| 6511 | SAWZALL 2 SPEED WITH CASE | 139 |
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| SKS | NARROW CROWN STAPLER 5/8"-1 1/5" | 269 |

## AIRMARK

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|---|---|---|
| AT64 | 16 GAUGE FINISH NAILER 1" - 2 1/2" CAP | 184 |
| AT550S | 1 1/2 HP SHUTTLE COMPRESSOR | 269 |
| AT550T | 1 1/2HP TWIN TANK COMPRESSOR | 299 |
| AT550P | 1 1/2 HP PANCAKE COMPRESSOR | 299 |
| AT800T | 2 HP TWIN TANK COMPRESSOR | 409 |

## BOSCH

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|---|---|---|
| 1003VSR | 3/8" VSR DRILL W/KEYLESS CHUCK | 88 |
| 1194VSR | 1/2" VSR, 2 STAGE HAMMER DRILL | 139 |
| 1272D | 3" X 24" DUSTLESS BELT SANDER | 209 |
| 1273D | 4" X 24" DUSTLESS BELT SANDER | 214 |
| 1273DVS | 4" X 24" VS DUSTLSS BELT SANDER | 229 |
| 1370DEVS | 6" VS DSTLS RNDM ORB SNDR | 234 |
| 1584VS | CLIC BARREL HANDLE JIG SAW, VS | 148 |
| 1584VSA | 1584VS JIG SAW W/CASE | 168 |
| 1584VSB | 1584VS JIG SAW W/CASE & 20 BLADES | 182 |
| 1584DVS | BARREL HANDLE JIG SAW, DUSTLS | 193 |
| 1587VS | TOP HANDLE JIG SAW, VARSP | 148 |
| 1587VSA | 1587VS JIG SAW W/CASE | 168 |
| 1587VSB | 1587VS JIG SAW W/CS & 20 BLADES | 182 |
| 1587DVS | TOP HANDLE JIG SAW, DUSTLESS | 193 |
| 1604 | 1 3/4 HP ROUTER | 142 |
| 1608 | LAMINATE TRIMMER | 97 |
| 1609KX | DELUXE INSTALLERS KIT W/4 BASES | 229 |
| 1613EVS | 2 HP VAR SP PLUNGE ROUTER | 197 |
| 1613EVSK | 1613EVS 2W/RA1051 EDGE GUIDE | 218 |
| 1614EVS | 1 1/4 HP VAR SP PLUNGE ROUTER | 159 |
| 1615EVS | 3 1/4 HP VAR SP PLUNGE ROUTER | 289 |
| 1615EVSK | 1615 EVS W/RA1051 EDGE GUIDE | 309 |
| 3051VSRK | 9.6V CRDLS KIT W/2 BATT KEYLESS | 139 |
| 3054VSRK | 12V CORDLESS KIT W/2 BAT, CASE | 188 |
| 3283DVS | 5" VS DUSTLESS RANDOM ORBIT | 95 |
| 3283DVSK | INCLUDES CASE, SANDER & ACCESSRS | 119 |
| B7000 | TRIANGULAR CORNER SANDER | 69 |
| B7000A | B7000 W 10 PCS PAPER, EXTENDER & POLISH PAD | 84 |
| B1650K | *NEW* PLATE JOINER KIT | 159 |
| B2300K | 12V CORDLESS DRILL KIT W/2 BAT | 174 |
| B4050 | *NEW* IN LINE GRIP JIGSAW | 113 |
| B6500 | 3/8" HAMMER DRILL | 119 |

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| 66 | 5 H P, 1 PH 10"T.A. SAW W/50" FENCE | 1995 |
| 73 | 1 1/2 HP DUST COLLECTOR | 394 |

## Panasonic

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|---|---|---|
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| EY6100CRKW | *NEW PREDATOR* 12V CORDLESS KIT VSR W/KYLS CHUCK, 22 STAGE CLUTCH W/2 BAT, CASE, & CHARGER | 184 |
| EY6100CQKW | 12V CORDLESS VSR KIT W/2 BAT, CASE & 15 MIN CHARGER & FLASHLIGHT | |
| | GIFT PACK | 204 |

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| 2037 | 5.4 AMPS VSR DRYWALL SCREWDRIVER | 97 |
| 2054 | 5.4 AMP VSR SCREWGUN, 0-2500 RPM | 155 |
| 2610 | 1/2" SPADE HANDLE DRILL, 7 AMPS | 145 |
| 2660 | 4.5 AMPS VSR DRYWALL SCREWDRIVER | 78 |
| 2750 | 4 1/2" RIGHT ANGLE GRINDER | 84 |
| 4052 | 7" RIGHT ANGLE SANDER | 135 |
| 4075 | 7"/9" RIGHT ANGLE SANDER | 143 |
| 4076 | WILDCAT 7" RIGHT ANGLE SANDER | 143 |

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| 0350SK | 15 & 16 GA. FINISH NAILER 3/4"-2" W/CASE & 5000 ASSORTED BRADS | 194 |
| 0565T | ANGLE FINISH NAILER,1"-2 1/2" | 204 |
| 0626SK | NARROW CROWN 1/4" STAPLER 1/2"-1" WITH CASE & 5000 STAPLES | 104 |
| 0645S | NARROW CRN 1/4" STAPLER 3/4" - 1 3/4" | 189 |
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## HITACHI

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| DS10DVA4BE | 12V CORDLESS DRILL KIT W/2 BAT | 192 |
| M12V | 3 HP VAR SPEED PLUNGE ROUTER | 235 |
| N5008AA | STANDRD CRWN CONSTRCTN STAPLR | 319 |
| NT45A | 18 GA. FINISH NAILER W/CASE | 289 |
| NV83A | FULL HEAD CONSTRCTN COIL NAILER | 429 |
| P20SB | 3 1/4" PLANER, 3.4 AMP | 92 |
| TR12 | 3 HP PLUNGE ROUTER | 192 |

## Makita

| | | |
|---|---|---|
| 6172DWE | 7.2V CDLS DRILL KIT W/2 BATT | 99 |
| 6095DWE | 9.6V CDLS DRILL KIT W/2 BATT | 145 |
| DA391DW | 9.6V ANGLE DRILL KIT | 175 |
| 5090DW | CORDLESS CIRCULAR SAW KIT | 139 |
| 4190D | COIRDLESS TILE CUTTER | 109 |
| 6211DWE | 12V KIT W/2 BATTERIES | 175 |
| 5007NBK | 7 1/4" CIRC SAW W/CASE & BLADE | 129 |
| LS1011 | 10" COMPOUND MITER | 539 |
| LS1211 | 12" COMPOUND MITER | 849 |
| N1900B | 3 1/4" PLANER | 129 |
| BO5001 | 5" RANDOM ORBIT SANDER | 69 |
| GV5000 | 5" SANDER POLISHER, VAR SPEED | 79 |
| 6510LVR | 3/8" DRILL | 95 |
| DA3000R | 3/8" ANGLE DRILL | 189 |
| 9.6V BATTERY | | 29 |
| 7.2V BATTERY | | 24 |

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## SKIL

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| 77M | 7 1/4" MAGNESIUM WORM DRIVE SAW | 164 |
| 1605-02 | BISCUIT JOINER | 136 |
| 2736-04 | 12V VSR CORDLESS DRILL KIT | 145 |
| 5657 | 7 1/4" CIRCLE SAW | 99 |
| 5657K | 5657 W/6 CARBIDE BLADES | 124 |
| 5860 | 8 1/4" WORM DRIVE SAW | 184 |
| 3400 | 10" TABLE SAW | 189 |

## DeWALT

| | | |
|---|---|---|
| DW318K | 4.5 AMP HVY DTY JIG SAW KIT W/CS | 156 |
| DW360 | 7 1/4" SAW W/BRAKE | 149 |
| DW420 | 5" RANDOM ORBIT SANDER, PSA | 69 |
| DW421 | 5" DSTLS RNDM ORB SANDER, VEL.CRO | 79 |
| DW430 | 3" X 21" DUSTLESS BELT SANDER | 169 |
| DW431 | 3" X 21" DSTLS BELT SANDER VAR SP | 188 |
| DW610 | 1 1/2 HP ROUTER, 9 AMP | 149 |
| DW614 | 1 1/4 HP PLUNGE ROUTER | 149 |
| DW615 | 1 1/4 HP PLUNGE ROUTER, VAR SP | 164 |
| DW624 | 3 HP HVY DUTY PLUNGE ROUTER | 245 |
| DW625 | 3 HP HVY DTY PLUNGE RTR, VAR SP | 279 |
| DW670 | *NEW* LAMINATE TRIMMER WITH GUIDE | 97 |
| DW682K | BISCUIT JOINER KIT | 224 |
| DW930 | 12V CORDLESS CIRCULAR SAW | 109 |
| DW930K | 12V CRDLS CIRC SAW KIT W/BAT & CS | 199 |
| DW935 | 14.4V TRIM SAW | 149 |
| DW935K | 14.4V TRIM SW KIT W/BAT, CHRGR, CS | 249 |
| DW972K2 | *NEW* 12V CRDLS KIT/W BATTERY & CASE | 189 |
| DW991K | 14.4V CRDLS KIT W/BATTERY & CASE | 199 |

## RYOBI

| | | |
|---|---|---|
| D38VSR | 3/8" VSR DRILL, 4.0 AMP, 0-2500 RPM | 59 |
| DC500 | DETAIL CARVER | 62 |
| DS2000 | DETAIL SANDER | 62 |

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| TR215 | 8 1/2" SLIDE COMPOUND MITER SAW | 369 |
| JS100 | BISCUIT JOINER | 164 |
| JS102 | BISC JOINER W/TILT FENCE & DUSTBG | 189 |
| FT2000E | 3 1/4 hp ROUTER VAR SPD | 205 |
| EB100 | EDGE BANDING SYSTEM | 209 |
| EDS132 | 13.2V CRDLS DRILL KIT W/2 BAT | 215 |
| FB107 | 7 PIECE FORSTNER BIT SET | 57 |
| FC107 | 7 PC CARBIDE FORSTNER BIT SET | 84 |
| LM72M010 | 10" X 24T FLAT TOP RIP BLADE | 36 |
| LU82M010 | 10"X 60T CROSSCUT/RIP BLADE | 49 |
| LU84M010 | 10" X 50T ATB COMBO BLADE | 40 |
| LU85M010 | 10" X 80 T ATB FOR MIRROR FINISH! | 58 |
| LU87M010 | 10" X 24T RIP BLADE THIN KERF | 39 |
| LU88M010 | 10" X 60T CROSSCUT THIN KERF | 45 |
| LU89M010 | 10" X 72T TCH NON FERROUS METAL | 57 |
| LU92M010 | 10" X 80T TCH - BEST FOR LAMINATES | 59 |
| LU96M010 | 10" X 80 T TCH LAMINATES OR WOOD | 67 |
| SD308 | 8" SAFETY DADO WITH CASE | 116 |
| SD508 | *NEW 8" SUPER DADO SET* | 168 |
| WC104 | 4 PIECE WOOD CHISEL SET | 46 |
| WC110 | 10 PIECE WOOD CHISEL SET | 86 |
| 94-100 | CABINET DOOR SET | 158 |

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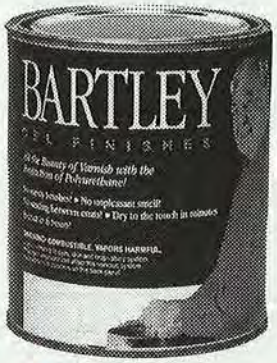


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*Continued from page 96*

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***—Tested by Bob McFarlin***

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## DELTA TOOLS

| Model | Description | List | Sale |
|---|---|---|---|
| 23-700 | Wet/Dry Grinder | 234 | 155 |
| 23-680 | 6" Bench Grinder 1/4 HP | 86 | 75 |
| 11-950 | 8" Drill Press | 199 | 135 |
| 31-050 | 1" Belt sander 2.0 amp | 104 | 75 |
| 31-460 | 4" Belt/Disc Sander | 198 | 129 |
| 31-340 | 1" Belt/8" Disc Sander | 268 | 204 |
| 40-560 | 16" 2 speed Scroll Saw | 266 | 178 |
| 11-990 | 12" Bench Drill Press | 276 | 195 |
| 11-090 | 32" Radial Bench Drill Press | 399 | 305 |
| 43-505 | 1/2" Bench Router/Shaper | 399 | 289 |
| 22-540 | 12" Bench Top Planer | Sale | 385 |
| 36-220 | 10" Compound Mitre Saw | 350 | 219 |
| 28-180 | Bench Band Saw | 232 | 158 |
| 28-190 | NEW 12" Band Saw | 465 | 395 |
| 40-640 | 20" Bench Scroll Saw | 466 | 295 |
| 37-070 | NEW 6" w/spd Bench Jointer | 337 | 258 |
| 14-650 | Hollow Chisel Mortiser | 668 | 289 |
| 46-700 | 12" Wood Lathe | 548 | 449 |
| 33-990 | 10" Radial Arm Saw | 818 | 699 |
| 37-280 | 6" Motorized Jointer | 488 | 389 |
| 50-179 | 3/4 HP 2 stage Dust Collector | 483 | 365 |
| 33-055 | 8-1/4" Sawbuck comp w/legs | 865 | 625 |
| 34-330 | 8-1/4" Table Saw 13 amp | 343 | 245 |
| 32-100 | Stationary Plate Jointer | 645 | 255 |
| 36-040 | 8-1/4" Compound Mitre Saw | 224 | 149 |
| 34-915 | 30" Unifence | 385 | 235 |
| 34-897 | 50" Delta Unifence | 525 | 299 |
| 36-755 | 10" Tilt Arbor Saw | 1264 | 995 |
| 17-900 | 16-1/2" Floor Drill Press | 462 | 399 |
| 33-060 | "Sidekick" Miter Saw | 510 | 389 |
| 37-190 | NEW 6" Deluxe Jointer | 554 | 479 |
| 36-275 | NEW 8-1/4" Builders Saw | 444 | 265 |
| 36-210 | NEW 10" Compound Mitre Saw | 438 | 255 |
| 36-070 | NEW 10" Mitre Saw | 284 | 165 |
| 36-830 | NEW 10" Contractors Saw II | 700 | 579 |
| 34-555 | NEW Sliding Table | 459 | 345 |
| 28-283 | 14" Band Saw w/enc. stand | 910 | 745 |
| 22-661 | 13" Planer w/ 2HP motor | 1513 | 1215 |
| 37-154 | DJ15 6"Jointer w/3/4HP motor | 1451 | 1215 |
| 34-444 | Contractors Table Saw | 812 | 649 |
| 34-445 | 34-444 Saw w/30" Unifence | 1200 | 775 |
| 34-445K | 34-445 Saw w/ mobile base | Sale | 819 |

## MILWAUKEE TOOLS

| | | | |
|---|---|---|---|
| 6527 | NEW Sawzall with case | 320 | 172 |
| 6528 | above Sawzall w/wired cord | 316 | 172 |
| 0407-1 | 12V Drill w/kyls chuck & 2 batt | 172 | |
| 0406-1 | 9.6V Drill Kit with 2 batteries | 332 | 159 |
| 0224-1 | 3/8" Drill 4.5 amp magnum | 227 | 124 |
| 0234-1 | 1/2" Drill 4.5A mag 0-850 rpm | 237 | 128 |
| 0244-1 | 1/2" Drill 4.5A mag 0-600 rpm | 237 | 128 |
| 0222-1 | 3/8" Drill 3.5 amp 0-1000 rpm. | 198 | 109 |
| 0228-1 | 3/8" Drill 3.5 amp 0-1000 rpm. | 195 | 109 |
| 0375-1 | 3/8" close quarter Drill | 237 | 135 |
| 0379-1 | 1/2" close quarter Drill | 268 | 155 |
| 6546-1 | cdls Scrwdvr 200 & 400 rpm | 141 | 84 |
| 6547-1 | 6546-1 w/bits, 1/4" chuck, & cse | 176 | 105 |
| 5399 | 1/2" D-hdle Hammer Drill Kit | 332 | 194 |
| 6507 | Original SawZall with case | 264 | 144 |
| 8977 | Variable temp. Heat Gun | 131 | 79 |
| 5397-1 | 3.8" var. spd Hammer Drill Kit | 255 | 142 |
| 5371-1 | 1/2" var. spd Hammer Drill Kit | 340 | 188 |
| 3107-1 | 1/2" v/spd right angle Drill Kit | 399 | 219 |
| 6754-1 | Drywall Gun 0-4000 5.4 amp. | 196 | 114 |
| 3300-1 | 1/2" var. spd right angle Drill | 356 | 194 |
| 5680 | Router 2 HP w/ 1/4" & 1/2" collets | 362 | 165 |
| 0235-1 | 1/2" Drill w/keyless chuck | 237 | 128 |
| 6142 | 4-1/2" Grinder w/cse & access. | 208 | 124 |
| 6749-1 | Drywall Gun 0-2500 5.4 amp. | 218 | 128 |
| 6365 | 7-1/4" Circular Saw 13 amp | 218 | 122 |
| 6366 | 6365 w/fence & carbide blade | 228 | 129 |
| 6368 | 6365 w/fence,carb. blde,& cse | 249 | 139 |
| 6377 | 7-1/4" Worm Drive Saw | 330 | 189 |
| 6256 | Top Handle Jig Saw | 264 | 148 |
| 6490 | 10" Mitre Saw | 444 | 255 |
| 6491 | 6490 w/ carbide blade & bag | 532 | 275 |
| 6494 | NEW 10" Compound Mitre Saw | 444 | 309 |

## QUICK DRIVE KITS

| | | | |
|---|---|---|---|
| SG-2000 | Subfloor/drywall, drives screws 1" - 2", complete kit incl. extension | 765 | 485 |
| SG-3000 | Deck/subfloor, drives screws 2" - 3", complete kit incl. extension. | 936 | 595 |

## FREUD CARBIDE TIPPED SAW BLADES
### 5/8" Bore - Industrial Grade

| Item | Description | Teeth | List | Sale |
|---|---|---|---|---|
| LU72M010 | Gen Pur. A.T.B. | 10° 40 | 69 | 39 |
| LU82M010 | Cut-off 10" | 60 | 93 | 49 |
| LU84M011 | Comb 10" | 50 | 78 | 42 |
| LU85M010 | Super Cut-off | 10° 80 | 115 | 59 |
| LM72M010 | Ripping 10" | 24 | 69 | 38 |
| LU73M010 | Cut off 10" | 60 | 84 | 45 |
| LU87M010 | Thin Kerf 10" | 24 | 72 | 39 |
| LU88M010 | Thin Kerf 10" | 60 | 88 | 45 |
| LU98M010 | Ultimate 10" | 80 | 128 | 68 |
| LU91M010 | Compnd Mitre 10" | 60 | 88 | 54 |
| F410 | NEW Quiet Blade 10" | 40 | 95 | 49 |
| F810 | NEW Quiet Blade 10" | 80 | 135 | 74 |
| TK303 | 7-1/4" Finishing | 40 | 38 | 22 |
| TK906 | 10" Combo | 50 | 53 | 32 |
| SD308 | 8" Dado - Carbide | | 230 | 119 |
| SD506 | 6" carbide w/case & shims | | 292 | 155 |
| SD508 | 8" carbide w/case & shims | | 344 | 168 |
| F0 | 1-3/4" x 5/8" Biscuit 1000 Qty | | 43 | 29 |
| F10 | 2-1/8" x 3/4" Biscuit 1000 Qty | | 43 | 29 |
| F20 | 2-3/4" x 1" Biscuit 1000 Qty | | 45 | 29 |
| FA | Assorted Biscuits 1000 Qty | | 45 | 29 |
| FB100 | 16 piece Forstner Bit Set | | 338 | 189 |
| 94-100 | 5 pc. Router Bit Door System | | 320 | 159 |
| TR215 | NEW 10" Slide Cmpd Mitre Saw | | 688 | 369 |
| JS102 | NEW Biscuit Jointer w/adj.fnc&cs | | 355 | 179 |
| FT2000E | 3-1/4 HP w/sp Plunge Router | | 410 | 205 |
| JS100 | Biscuit Jointer with case | | 334 | 164 |

## MAKITA TOOLS

| Model | Description | List | Sale |
|---|---|---|---|
| 6070DW | 3/8" v/spd Reverse Drill 7.2V | 128 | 64 |
| 6172DWE | 3/8" v/spd Drill Kit w/ 2 batt | 220 | 109 |
| 5090DW | 3-3/8" Saw Kit 9.6 volt | 270 | 145 |
| ML900 | Incandescent Flashlight 9.6V | Sale | 37 |
| DA391DW | 3/8" angle Drill Kit 9.6 volt | 312 | 179 |
| 6012HDWE | 2 speed Drill Kit w/2 batt. | 243 | 135 |
| 6093DWE | 6093DW Drill Kit w/2 batteries | 270 | 139 |
| 6095DWE | 6095DW Drill Kit w/2 batteries | 270 | 139 |
| 6095D | 6095DW Drill only & case | Special | 79 |
| 6201DWE | 9.6V Drill Kit w/2 batt. | 298 | 155 |
| 6211DWE | 12V Drill Kit with 2 batteries | 330 | 165 |
| 632007-4 | 9.6 volt Battery | 47 | 30 |
| 632002-4 | 7.2 volt Battery | 39 | 28 |
| 5007NBA | 7-1/4" Saw w/electric brake | 263 | 135 |
| 5008NBA | 8-1/4" Saw w/electric brake | 346 | 195 |
| 9900B | 3" x 21" Belt Sander w/bag | 344 | 175 |
| 9924DB | 3" x 24" Belt Sander w/bag | 329 | 184 |
| 4301BV | Orb. var. spd Jig Saw 3.5A | 292 | 158 |
| JR3000V | var. speed Recip Saw w/case | 252 | 135 |
| 9820-2 | Blade Sharpener | 394 | 209 |
| N1900B | 3-1/4" Planer with case | 244 | 129 |
| N9514B | 4" Disc Grinder 4.6 amp | 111 | 65 |
| B04550 | 1/4 sheet Pad Sander w/bag | 98 | 52 |
| DA3000R | 3/8" Angle Drill | 314 | 179 |
| 2708W | 8-1/4" Table Saw | 585 | 298 |
| 2711 | 10" Table Saw with brake | 1067 | 565 |
| 6404 | 3/8" Drill Rev. 0-2100 rpm | 112 | 65 |
| 6510LVR | 3/8" Drill Rev. 0-1050 rpm | 168 | 98 |
| 6013BR | 1/2" Drill Rev. 6 amp | 280 | 149 |
| 9401 | 4" x 24" Belt Sander w/bag | 378 | 229 |
| 4302C | var. speed Orbital Jig Saw | 351 | 199 |
| 5077B | 7-1/4" Hypoid Saw | 281 | 155 |
| 5007NB | 7-1/4" Circular Saw 13 amp | 232 | 124 |
| 5007NBK | 5007NB Saw w/ plastic case | Sale | 129 |
| LS1011 | 10" Slide Compound Saw | 946 | 525 |
| LS1211 | New 12" Slide Cmpd Saw | 1550 | 865 |

## SIOUX TOOLS

| | | | |
|---|---|---|---|
| 8030 | New 3/8" var/spd Drill | 250 | 145 |
| 8000 | 3/8" var/spd close qtr Drill | 201 | 125 |
| 690 | 5" Air Random Orbit Sander | 139 | 132 |

## SENCO AIR NAILERS

| | | | |
|---|---|---|---|
| SFN1 | Finishing Nailer 1" - 2" | 448 | 305 |
| SN325 | Nailer 1-7/8" - 3-1/4" | 665 | 415 |
| SLP20 | New Pinner w/cse 5/8 -1-5/8" | 399 | 269 |
| SKS | Stapler 5/8" - 1-1/2" | 390 | 269 |
| SN70 | Fram. Nailer Clip Hd 2"-3-1/2" | 690 | 475 |
| SN60 | Fram. Nailer-Full Hd 2"-3-1/2" | 638 | 445 |
| SFN40 | NEW Finish Nailer 1-1/4 - 2-1/2 | 571 | 385 |

## BOSTITCH AIR NAILERS

| | | | |
|---|---|---|---|
| N80S-1 | Stick Nailer | Super Sale | 348 |
| RN45 | Coil Roof Nailer 3/4 - 1-3/4 | 845 | 409 |
| N60FN-2 | Finishing Nailer | 650 | 335 |
| BT35-2 | Brad Tacker 5/8" - 1-3/8" | 275 | 165 |
| BT35-2K | BT35-2 w/ case, oil, & brads | 299 | 175 |
| CWC100 | 1 HP Pancake Compressor | 463 | 289 |
| MIIIFS | Flooring Stapler 15 gauge | 931 | 535 |
| S32SX-2 | Finish Stapler - 1/2" - 1-3/8" | 275 | 165 |
| S32SX-2K | S32SX-2 with case & oil | 269 | 179 |

## SKIL SIZZLERS

| | | | |
|---|---|---|---|
| 77 | 7-1/4" Worm Drive Saw | 257 | 144 |
| 77M | NEW 77 Mag Worm Saw | 300 | 164 |
| 2735-04 | 12 volt cordless Drill Kit | 249 | 144 |
| 2736-04 | 2735-04 with keyless chuck | 269 | 148 |
| 1605-02 | Biscuit Joiner w/case | 221 | 139 |
| 3400 | 10" Table Saw - Bench Top | 270 | 189 |

## PANASONIC CORDLESS

| | | | |
|---|---|---|---|
| EY6205EQK | Same as EY6205BC but comes with Ironman battery | 368 | 192 |
| EY6207BC | NEW 12 volt 1/2" Drill w/keyless chuck var. speed w/15 min. charger & case | 420 | 222 |
| EY6282EQK | Var. spd 9.6 volt Drill with 15 min. charger, case & NEW Ironman battery | 315 | 169 |
| EY62821DKW | 9.6 volt Drill Kit w/2 batt. | 395 | 162 |

## NEW PREDATOR DRILLS

| | | | |
|---|---|---|---|
| EY6181CRKW | NEW 9.6V Compact Drill Kit w/2 batt - 10% more pwr than EY62821DKW | 305 | 165 |
| EY6100CRKW | NEW 12 volt Drill Kit with 2 batteries, 1 hour charger, & case | 358 | 185 |
| EY6100CQKW | Same as EY6100CRKW but has 15 minute charger | 420 | 198 |
| EY6100EQK | NEW 12 volt Drill kit with NEW Ironman battery, 15 min. charger, & cse | 375 | 199 |
| EY6100EQKW | Same as EY6100EQK but w/2 Ironman batteries | 473 | 225 |

## PASLODE IMPULSE GUNS

| | | | |
|---|---|---|---|
| IM250 | Trimpulse Finish Nailer Kit | 849 | 565 |
| IM325 | Impulse Framing Nailer Kit | 849 | 565 |

## WAGNER PAINT & SPRAYER PRODUCTS

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|---|---|---|---|
| 230HD | Power Painter/Sprayer | 100 | 95 |
| 255 | Airless Kit | 180 | 135 |
| 375E | Airless System | 195 | 159 |
| 505 | High performance Airless Painter | 440 | 369 |
| HVLP | Fine coat finishing HVLP System | 195 | 155 |
| CS2000 | Pro fine finish HVLP System | 339 | 278 |


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Same as Senco SLP-20
**List 180 Sale 98**

**0250SK**
Brad Nailer 3/4"-2"
**List 296 Sale 164**

**0626SK**
1/4" Crown Stapler 3/8"-1"
**List 194 Sale 104**

**0635SK**
1/4" Crown Stapler 1/2"-1-3/8"
Same as Senco SKS
**List 310 Sale 175**

**EZ-1**
New Multi-purpose nailer & stapler
**List 180 Sale 98**

**Above Nailers come w/case, fasteners, oil & wrenches**

**0565T**
Angle Finish Nailer 1"-2-1/2"
**List 386 Sale 205**

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## DEWALT TOOLS

| Model | Description | List | Sale |
|---|---|---|---|
| DW364 | 7-1/4" Circ. Saw w/brake | 285 | 154 |
| DW945K-2 | 12V cdls Drill Kit w/2 batt | 309 | 179 |
| DW944K-2 | 9.6V cdls Drill Kit w/2 batt | 283 | 165 |
| DW610 | 1-1/2 HP 2 handle Router | 274 | 149 |
| DW411 | 1/4 sheet Palm Sander | 97 | 58 |
| DW100 | 3/8" Drill, 4 amp,0-2500 rpm | 118 | 68 |
| DW682K | Biscuit Joiner with case | 429 | 219 |
| DW705 | 12" Compound Mitre Saw | 706 | 359 |
| DW615 | 1-1/4 HP Elec. Plge Router | 290 | 164 |
| DW625 | 3 HP var. spd PlungeRouter | Sale | 275 |
| | **DW625 Router comes with FREE DW6966 Fine Depth Adjuster!** | | |
| DW930K | NEW 12V 5-3/8" Trim Saw kit | 370 | 199 |
| DW935K | NEW 14.4V 5-3/8" Trim Saw kit | 444 | 239 |
| | **DW935K comes with FREE DW9054 24 tooth carbide blade!** | | |
| DW675K | 3-1/8" Planer with case | 269 | 164 |
| DW431 | 3 x 21 v/spd Belt Sander | 331 | 179 |
| DW444 | 6" Ran Orb Sander-PSA pad | 266 | 149 |
| DW443 | DW444 w/hook & loop pad | 266 | 149 |
| | **NEW DEWALT CORDLESS DRILLS** | | |
| DW952K | 3/8" v/spd w/one 9.6V batt | 280 | 159 |
| DW953K | 3/8" v/spd w/one 12V batt | 306 | 175 |
| DW962K-2 | 3/8"v/sp w/two 9.6V XR batt | 324 | 179 |
| DW972K-2 | 3/8"v/sp w/two 12V XR batt | 352 | 189 |
| DW991K | 3/8"v/sp w/one 14.4V XR batt | 370 | 199 |
| | **Above drill kits come w/ charger & steel case!** | | |

## HITACHI TOOLS

| | | | |
|---|---|---|---|
| C8FB | 8-1/2" Slide Compound Saw | 1400 | 575 |
| P12R | 12-9/32" Planer | 1470 | 789 |
| P12RA | Planer/Joiner | 1940 | 989 |
| G12SA | 4-1/2" Grinder 6.9 amp | 160 | 89 |
| NR83A | Fram Nailer 2 - 3-1/2 Full Head | 700 | 395 |
| NR83AA | Framing Nailer 2 - 3-1/2 | 750 | 419 |
| NT65A | 16 ga. Brad Nailer 1 - 2-1/2 | 610 | 335 |
| NV45AB | Coil Roofing Nailer 7/8 - 1-3/4 | 750 | 419 |
| NV83A | Coil Nailer 2 - 3-1/4 | 750 | 419 |

## BIESEMEYER FENCES

| | | | |
|---|---|---|---|
| B-50 | 50" Commer. Saw Fence | 345 | 298 |
| T-SQUARE 52 | 52" Homeshop Fence | 279 | 238 |
| T-SQUARE 40 | 40" Homeshop Fence | 259 | 208 |
| T-SQUARE 28 | 28" Homeshop Fence | 249 | 198 |

## JORGENSEN ADJUSTABLE HANDSCREWS

| Item# | Jaw Length | Open Cap | List | Sale | Box of 6 |
|---|---|---|---|---|---|
| #0 | 8" | 4-1/2" | 19.76 | 11.75 | 58.00 |
| #1 | 10" | 6" | 22.63 | 12.50 | 68.00 |
| #2 | 12" | 8-1/2" | 25.95 | 14.50 | 78.00 |
| #3 | 14" | 10" | 32.88 | 18.00 | 99.00 |

## PONY CLAMP FIXTURES

| Model | | List | Sale | Lots of 12 |
|---|---|---|---|---|
| 50 | 3/4" Black Pipe Clamps | 14.87 | 7.80 | 88.95 |
| 52 | 1/2" Black Pipe Clamps | 12.40 | 6.70 | 71.50 |

## BOSCH

| Model | Description | List | Sale |
|---|---|---|---|
| 1587VS | NEW Top Hand "CLIC" Jig Saw | 292 | 149 |
| 1584VS | NEW Barrel "CLIC" Jig Saw | 285 | 149 |
| Bosch Metal Case for above Jig Saws | | 34 | 32 |
| Bosch 30 blade assortment for Jig Saws | | 1584VS or 1587VS with steel case and 30 Bosch blades | 28.99 Sale 189 |
| 1942 | Heat Gun 600° - 900° | 125 | 78 |
| 1272D | 3" x 24" Belt Sander with bag | 375 | 209 |
| 1273D | 4" x 24" Belt Sander with bag | 380 | 215 |
| 11212VSR | Bulldog 3/4"SDS Rtry Drill | 390 | 209 |
| 1347AK | 4-1/2" Grinder w/cs & access. | 185 | 109 |
| 1348AE | 5" Grinder 8.5 amp | 225 | 129 |
| 1194VSR | 1/2" var. speed Hammer Drill | 282 | 149 |
| 1194VSRK | above Hammer Drill w/case | 313 | 169 |
| 1608 | 5.6 amp Laminate Trimmer | 168 | 99 |
| 1609K | Lam Installers Kit with 1609 | 343 | 184 |
| 1609KX | Deluxe Installers kit | 405 | 234 |
| 1604A | 1-3/4 HP 2 Handle Router | 250 | 142 |
| 1604AK | same as above w/cse & acc | 318 | 185 |
| 1606A | 1-3/4 HP D-handle Router | 295 | 179 |
| 1593 | NEW 3-1/4" Planer 6.9 amp | 304 | 179 |
| 3270DVS | 3 x 21 v/spd belt sander w/ bag | 270 | 165 |
| 1273DVS | var. spd 4" x 24" Belt Sander | 415 | 225 |
| 1614EVS | 1-1/4HP v/spd Plge Rtr | 283 | 159 |
| 1613EVS | 2HP v/sp Plunge Router | 359 | 194 |
| 1615EVS | 3 HP v/spd Plge Router | 505 | 285 |
| 1632VSRK | Recip Saw 8.4A orb-v/spd | 225 | 159 |
| 3050VSRK | 9.6V cdls v/sp Drill Kit comp | 288 | 149 |
| 3051VSRK | 3050VSRK w/keyless chuck | 299 | 149 |
| 3054VSRK | 12V Drill Kit w/ 2 batteries | 330 | 185 |
| 3300K | NEW 12V Drill Kit w/ 2 batt | 348 | 199 |
| 3310K | NEW 12V T-handle Drill Kit with 2 batteries | 348 | 199 |
| 3110K | NEW 9.6V T-handle Drill Kit with 2 batteries | 320 | 185 |
| 1370DEVS | 6" Random Orbit Sander | 427 | 228 |
| 3283DVS | 5" Random Orbit Sander | 169 | 98 |
| 3283DVSK | 3283DVS Kit complete | 199 | 116 |
| B1650K | NEW Biscuit Joiner | 289 | 155 |
| B7000 | NEW Corner Detail Sander | 122 | 68 |
| B7001 | B7000 w/ variable speed | 156 | 95 |
| B4050 | NEW In Line Jig Saw | 199 | 115 |
| B9250 | NEW 5" v/spd Grinder -8.5 amp | 263 | 159 |

## AEG POWER TOOLS

| Model | Description | List | Sale |
|---|---|---|---|
| TXE150 | 6" var/spd Ran Orb Sander | 304 | 139 |
| HBSE75S | 3"x21" var/spd Belt Sander | 309 | 178 |
| BSPE100X | Top Handle Jig Saw w/case | 286 | 159 |
| FSPE100X | Barrel Grip Jig Saw w/case | 274 | 159 |

## PORTA NAILER

| | | | |
|---|---|---|---|
| 401 | Porta Nailer complete | 265 | 205 |
| 501 | Face Nailer complete | 265 | 205 |

## BLACK & DECKER

| | | | |
|---|---|---|---|
| 2694 | 7-1/4" Super Sawcat w/case | 285 | 158 |
| 2695 | 8-1/4" Super Sawscat w/case | 328 | 175 |

## DAVID WHITE

| | | | |
|---|---|---|---|
| LP6-20 | Sight Level package - 20x | 310 | 198 |
| LP6-20XL | LP6-20 w/9056 tripod & 7620 rod | 259 | 239 |
| LT8-300 | Level Transit - 26x | 695 | 439 |
| LT8-300P | above Level w/optical plum | 821 | 518 |
| LT6-900 | Level Transit - 20x | 389 | 239 |
| ALT6-900A | Automatic Level - Transit - 18x | 638 | 395 |
| ALTP6-900A | above Level w/tripod & rod | 708 | 469 |
| ALP6-18HD | above Level w/tripod & rod | 570 | 375 |
| ML100I | NEW Laser Level | 1099 | 945 |
| ML100 | NEW Laser Level w/detector | 1249 | 1075 |

## RYOBI SPECIALS

| | | | |
|---|---|---|---|
| TS-254 | 10" Mitre Saw | 440 | 209 |
| RE600 | 3 HP Plunge Router | 500 | 228 |
| BE321 | 3" x 21" var. spd Belt Sander | 310 | 148 |
| TFD222VRK | 12V cordless Drill Kit | 365 | 155 |
| TFF100 | Flashlight uses 7.2,9.6,12v battery | | 9.95 |
| BT3000 | 10" Table Saw with stand | 1125 | 529 |
| TSS220 | 8-1/2" Slide Comp. Saw | 966 | 445 |
| DS1000 | Detail Sander | 90 | 44 |
| AP12 | 12" Bench Planer | 884 | 395 |
| BS900 | 9" Bench Band Saw | 340 | 165 |
| OSS450 | Oscillating Spindle Sander | 340 | 159 |
| ML618 | NEW Mini Lathe var/spd | 418 | 225 |
| DC500 | NEW Detail Carver | 120 | 64 |

## WERNER LADDERS

| | | | |
|---|---|---|---|
| 6205 | 5' Fiberglass | 199 | 75 |
| 6206 | 6' Fiberglass | 225 | 86.95 |

| | | | |
|---|---|---|---|
| Msx636 FEIN | Triangle Sander Kit | Sale | 185 |
| LPN672 PONY | Air Palm Nailer w/glove | Sale | 94.99 |

## QUAL-CRAFT PRODUCTS

| | | | |
|---|---|---|---|
| 2200 | Pump Jack | 79 | 58 |
| 2201 | Pump Jack Brace | 30 | 20 |
| 2203 | Pump Jack guard rail holder | 31 | 21 |
| 2204 | Workbench & rail holder combo | 53 | 39 |
| | **Buy any 6 (can be assort.) deduct 10%** | | |
| 2601 | Wall Jack | 167 | 108 |
| | **Lots of 4 deduct additional 10%** | | |

## PORTER CABLE

| | | | |
|---|---|---|---|
| 690 | 1-1/2 HP Router 8 amp | 260 | 138 |
| 691 | 1-1/2 HP Router D-handle | 285 | 155 |
| 693 | 1-1/2 HP Plunge Router Base | 320 | 174 |
| 6931 | Plunge Router Base | 125 | 77 |
| 695 | 1-1/2 HP Router/Shaper | 400 | 223 |
| 696 | Heavy Duty Shaper Table | 230 | 129 |
| 351 | 3" x 21" Belt Sander w/o bag | 280 | 154 |
| 352 | 3" x 21" Belt Sander with bag | 290 | 159 |
| 352VS | 3x21 Belt Sander w/bag v/spd | 305 | 169 |
| 360 | 3" x 24" Belt Sander with bag | 365 | 198 |
| 361 | 3" x 24" Belt Sander w/o bag | 345 | 189 |
| 362 | 4" x 24" Belt Sander with bag | 380 | 205 |
| 97751 | 1/2" v/spd Hammer Drill w/cse | 270 | 155 |
| 9118 | Porta Plane Kit 7 amp | 390 | 215 |
| 505 | 1/2 sheet Pad Sander | 230 | 128 |
| 6611 | 3/8" var. speed Drill 5.2 amp | 220 | 122 |
| 6614 | 1/2" var. speed Drill 0-750 rpm | 230 | 128 |
| 6615 | 7514 with keyless chuck | 230 | 128 |
| 7549 | Top handle Jig Saw 4.8 amp | 270 | 135 |
| 330 | Speed Block Sander 1/4 sheet | 110 | 60 |
| 555 | Plate Biscuit Jointer with case | 320 | 149 |
| 556 | 555 jointer w/5556 tilt fence | Sale | 159 |
| 345 | 6" Saw Boss 9 amp | 190 | 104 |
| 9345 | 345 comp. w/cse & carb blde | 220 | 124 |
| 9647 | TIGER CUB Recip. Saw | 210 | 119 |
| 9637 | Full var/spd Recip Saw 8 amp | 270 | 148 |
| 7519 | 3-1/4 HP Router 2 Handle | 445 | 239 |
| 7518 | 3-1/4 HP 5 speed Router | 510 | 268 |
| 7538 | 3-1/4 HP Plunge Router | 445 | 239 |
| 7399 | 5.6 amp Drywall Cutout Unit | 140 | 84 |
| 7310 | 5.6 amp Laminate Trimmer | 165 | 95 |
| 97310 | Laminate Trimmer Kit comp | 360 | 198 |
| 7335 | 5" var. spd Rndm Orbit Sndr | 245 | 132 |
| 7336 | 6" var. spd Rndm Orbit Sndr | 250 | 137 |
| 73333 | Dust Collection system | 31 | 24.50 |
| 7539 | 3-1/4HP v/spd Plunge Router | 510 | 269 |
| 9853 | 12V 3/8" Drill w/ keyless chuck | 280 | 154 |
| 9855 | 12V 1/2" 2 spd,v/sp Drill w/cs | 335 | 188 |
| 8500 | 12v battery for above drills | Sale | 45 |
| 332 | Palm Grip Rndm Orbit Sander | 120 | 69 |
| 333 | above Sander with dust bag | 135 | 75 |
| 334 | 333 Sander with PSA pad | 135 | 74 |
| 340 | 1/4 Sheet Orb Sndr w/dust p/u | 89 | 55 |
| 7116 | 24" Omni Jig | 535 | 294 |
| 550 | Pocket cutter with case | 330 | 179 |
| 7700 | 10" "Lazerloc" Mitre Saw | 634 | 339 |

## New Tools by Porter Cable

| | | | |
|---|---|---|---|
| 310 | Production Laminate Trimmer | 250 | 145 |
| 347 | 7-1/4" "Framers" Circ Saw | 225 | 129 |
| 743 | 347 Saw - left hand version | 225 | 129 |
| 9743 | 743 Saw with case | 255 | 148 |
| 9347 | 347 Saw with case | 255 | 148 |
| 447 | 347 Saw with brake | 225 | 134 |
| 843 | 447 Saw-left hand version | 245 | 139 |
| 7800 | Drywall Sander | 585 | 329 |
| 7810 | Wet/Dry Vac for above sander | 455 | 259 |

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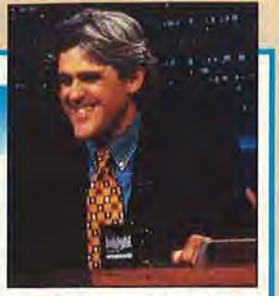
# FINISHING TOUCHES



## NEW GUINEA WOODS STAR ON *THE TONIGHT SHOW*

**The new set furniture for Jay Leno's *The Tonight Show* on late-night television was built from lesser-known species of environmentally certified tropical wood.**

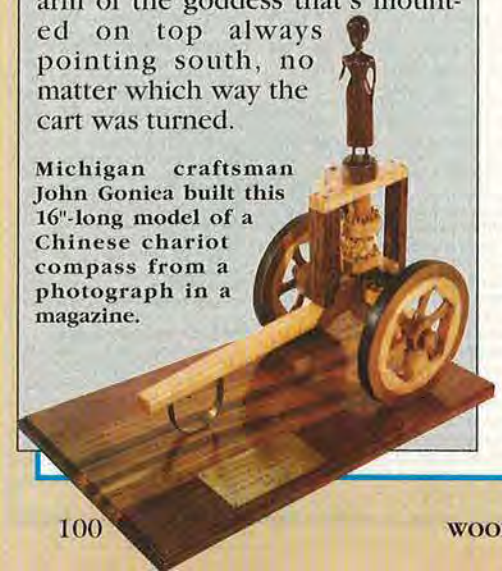
Narra and kwila, two tropical hardwood species, may not be household words, but since last September they've starred on late-night television. The highly figured woods showed up on Jay Leno's *The Tonight Show* as new furnishings for the set—a desk, end chairs, and side tables.

What's so remarkable about this new furniture? The wood used for it came from an environmentally certified community forestry program in Papua, New Guinea. It was certified by the Smart Wood Program of the Rainforest Alliance, in New York. Certification assures that the logging operation follows environmentally sound forestry practices and that none of the trees harvested are endangered species. The narra and kwila (just two of many lesser-known species beginning to appear on the market) were supplied by Eco Timber, a San Francisco company, and the furniture was designed by Roy McMakin, of Seattle. Domestic Furniture Co., in Los Angeles, built all the pieces.

## Which way is south?

Perhaps no other people in history cared more about direction than the Chinese. That's because one of their religious practices required dealing with the movement of spirits.

To avoid unpleasant collisions, they developed two types of compasses. One was the familiar magnetic-needle type. The other was a south-pointing chariot that relied on mechanical parts. The model shown *below* of a Chinese south-pointing chariot compass was built in walnut and maple by John Goniea of Hartland, Michigan. John says he built it from a magazine photograph. He also told us how the original (used about 120 A.D) worked. Apparently, wooden gears turned shafts to keep one arm of the goddess that's mounted on top always pointing south, no matter which way the cart was turned.

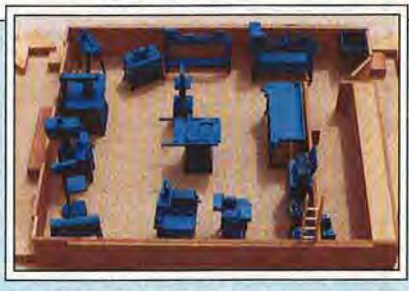


**Michigan craftsman John Goniea built this 16"-long model of a Chinese chariot compass from a photograph in a magazine.**

## A California model shop

Paul Burri of Ventura, California, couldn't wait to retire and move to a home where he would have an entire two-car garage for his shop. But planning it on paper or with cutouts to arrange machine placement just wasn't his style.

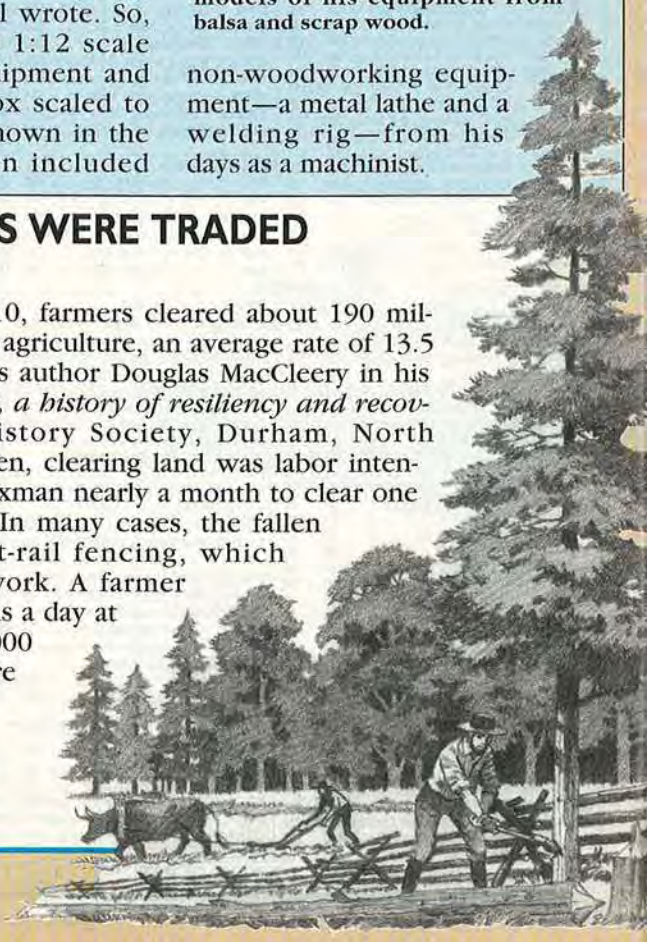
"Neither planning method gave me a feel for how much working space I needed," Paul wrote. So, he decided to build 1:12 scale models of all his equipment and arrange them in a box scaled to his future shop, as shown in the photo *right*. He even included non-woodworking equipment—a metal lathe and a welding rig—from his days as a machinist.



**To plan his new shop layout, woodworker Paul Burri made 1:12 scale models of his equipment from balsa and scrap wood.**

## WHEN FORESTS WERE TRADED FOR FARMING

Between 1850 and 1910, farmers cleared about 190 million acres of forests for agriculture, an average rate of 13.5 square miles a day, says author Douglas MacCleery in his book *American Forests, a history of resiliency and recovery* (1992, Forest History Society, Durham, North Carolina). And back then, clearing land was labor intensive—it took a strong axman nearly a month to clear one acre of mature forest. In many cases, the fallen timber went for split-rail fencing, which required even more work. A farmer could only split 100 rails a day at the best, and it took 8,000 rails to enclose a square 40-acre field!



Photographs: Courtesy of Eco Timber International; Paul Burri; John Goniea
Illustration: Jim Stevenson

# 300 lbs of pressure and 224 mph winds couldn't break this door down. Better not lose your keys.

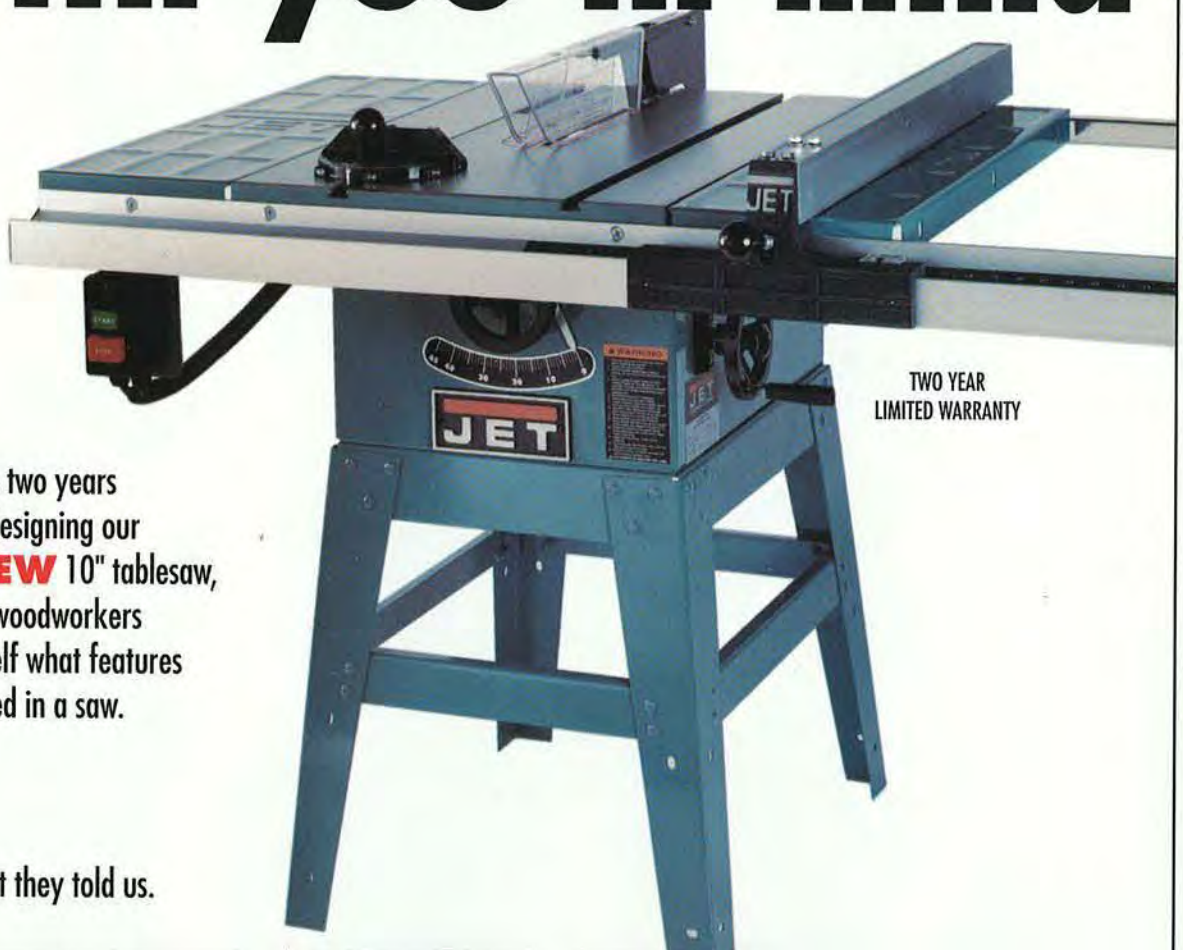
We don't test our doors at Stanley. We punish them. We punish them with wind. With water. With very large metal objects. And when we're done, we punish them some more.

If we sound like violent folks, please forgive us. We're not. In fact, we love flowers, birds and other living things. But to make a better door, you have to be tough.

That's why everything we make at Stanley is specifically designed to be around for a while. Like until the next millennium. Whether it's a mirror door that doesn't come off its track or a fiberglass hammer that doesn't break on mis-hits, the same will always be true. After all, we've been around for more than 150 years. So, we definitely know a thing or two about longevity.

**STANLEY**
helps you do things right.®

# A tablesaw built with you in mind

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Quick-release precision JETFENCE® allows smooth, accurate adjustments on either side of blade.

Dust hood with 4" outlet is built-in for easy hook-up to your collection system.

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**JUNE 1995** **ISSUE 79**

Dear Reader: As a service to you, we've included full-sized patterns on this insert for irregular-shaped and intricate project parts. You can machine all other project parts using the Bill of Materials and the drawings accompanying the project you're building.

Page 00

- Easy glider
- Spaghetti utensils
- Kid's teeter-totter
- Radial-arm saw stop
- Fish carving

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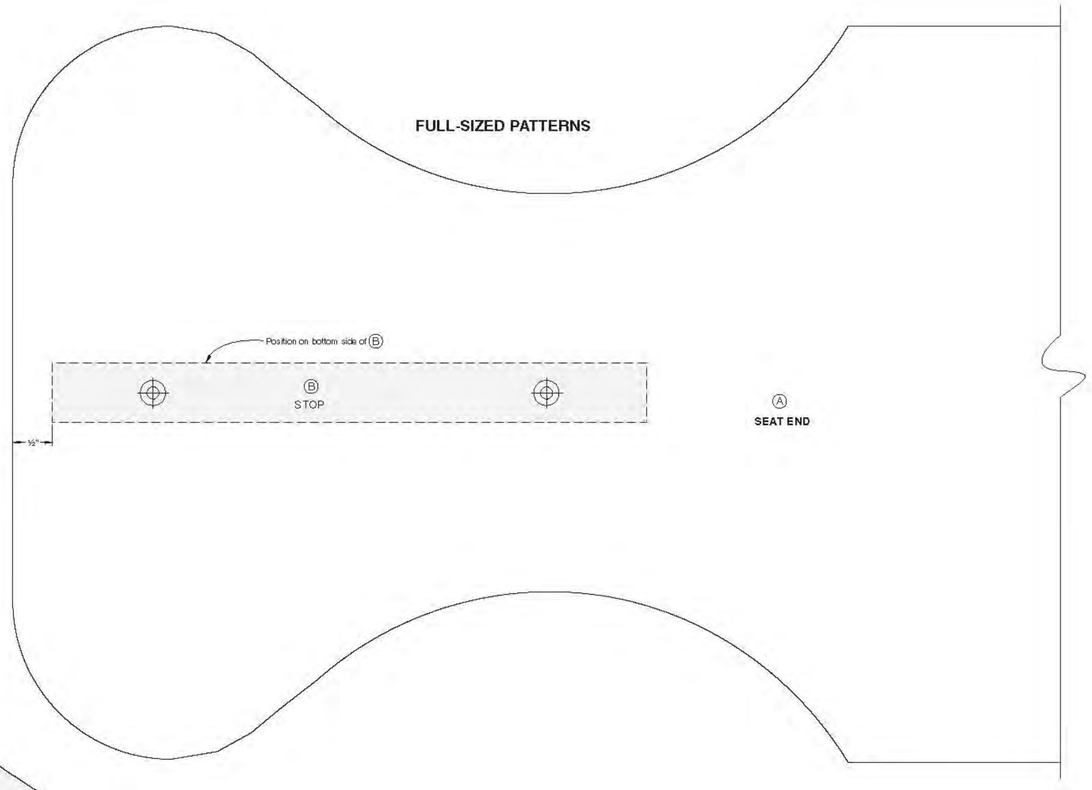
## FULL-SIZED PATTERNS




## KID'S TEETER-TOTTER
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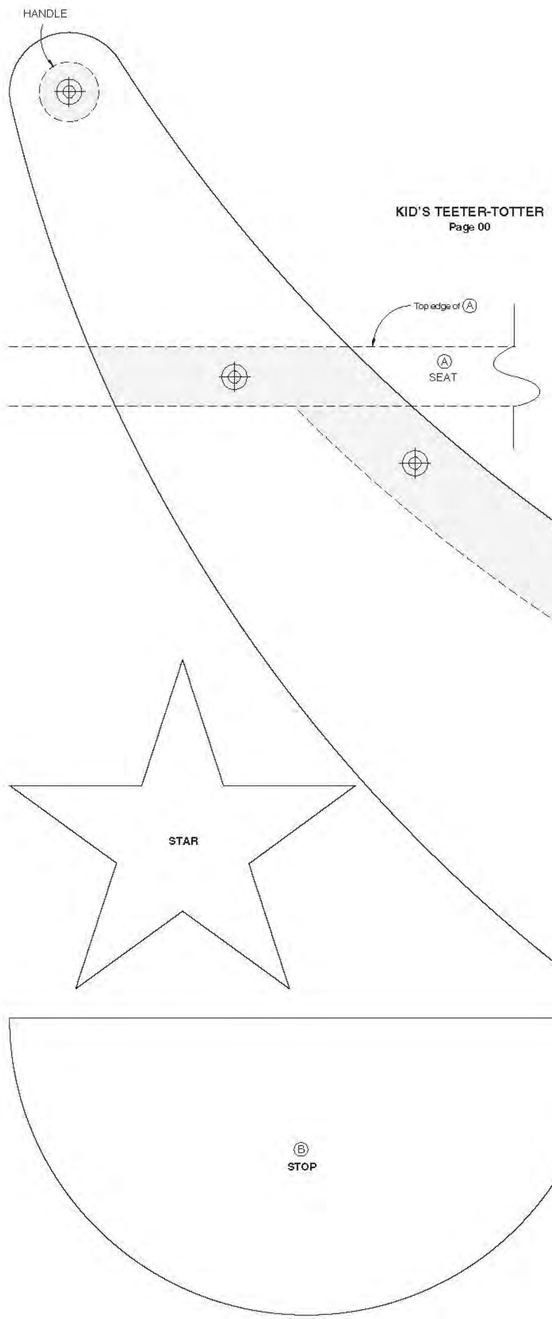
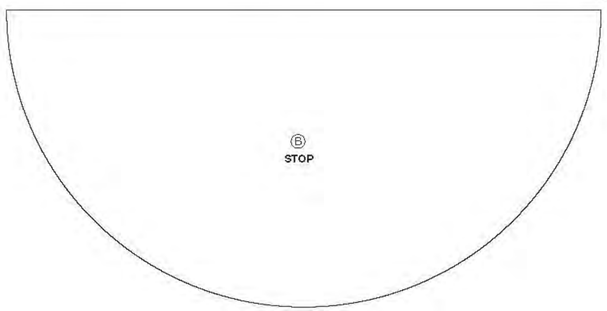
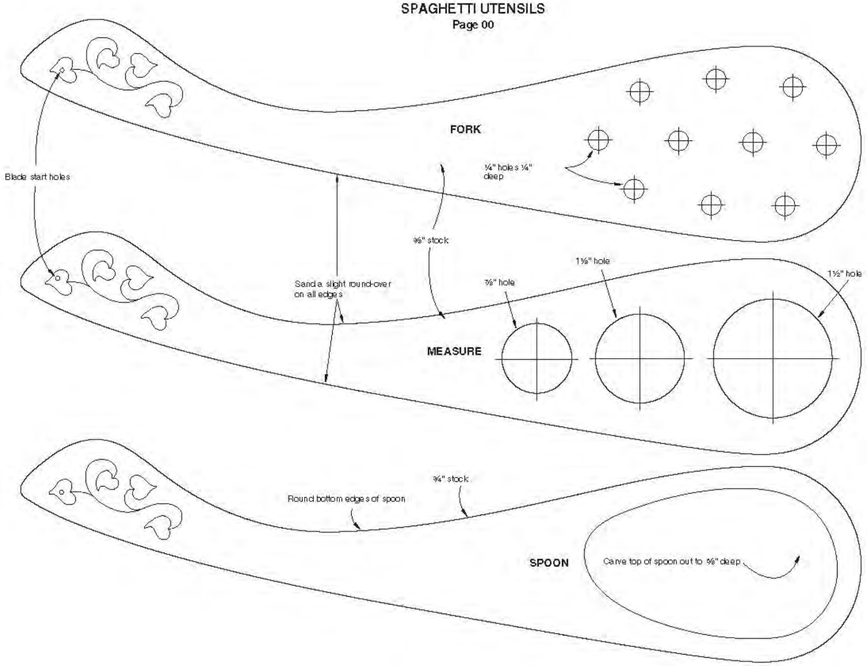


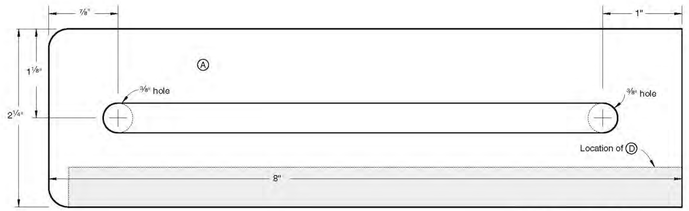


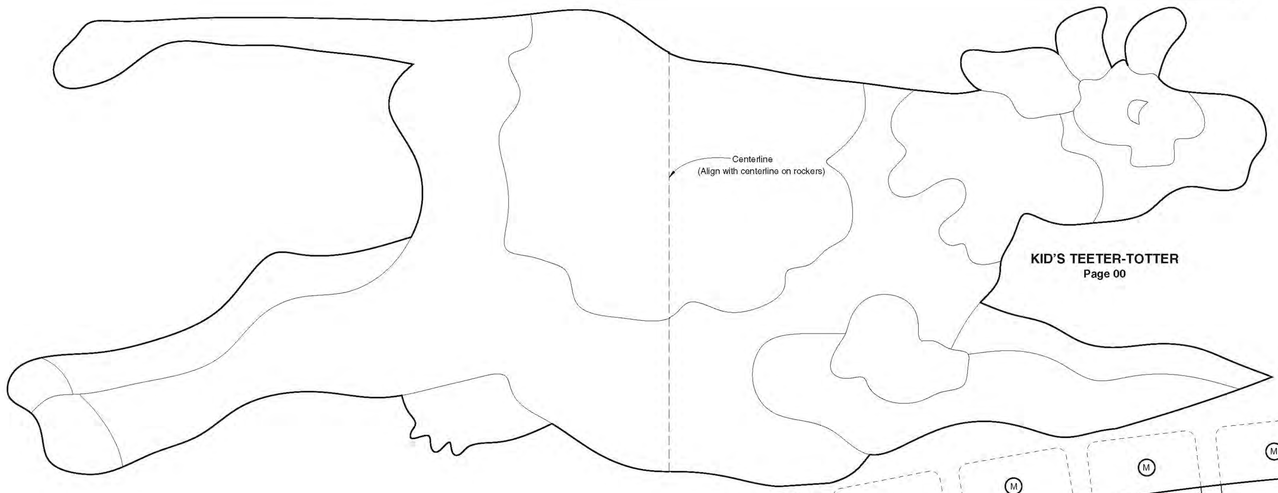




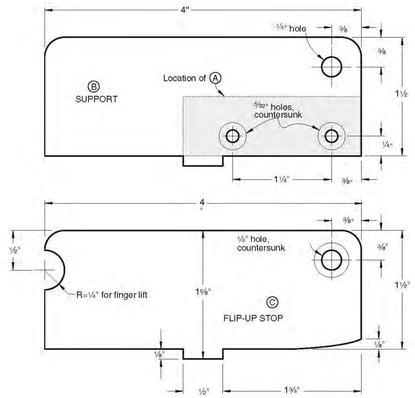

## SPAGHETTI UTENSILS
Page 00



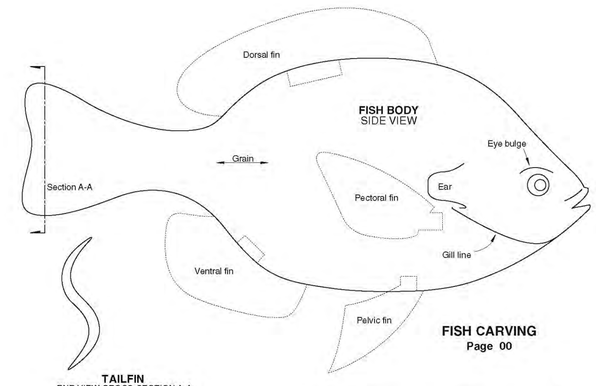



**KID'S TEETER-TOTTER**
**Page 00**



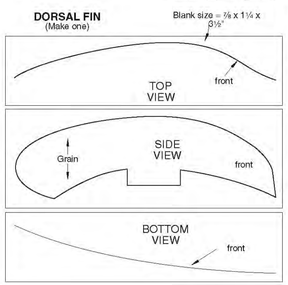

**RADIAL-ARM SAW STOP**
**Page 00**

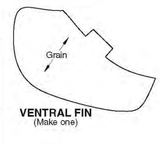



**FISH CARVING**
**Page 00**

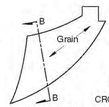
**TAILFIN**
END VIEW CROSS-SECTION A-A

## FULL-SIZED PATTERNS



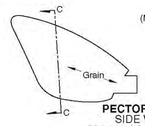




**VENTRAL FIN**
(Make one)



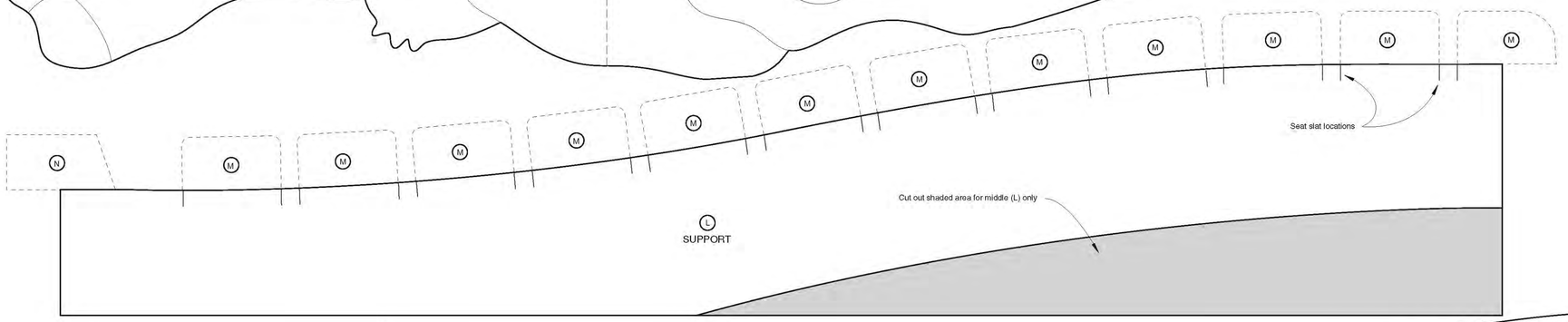

**PELVIC FIN**
SIDE VIEW
(Make one left and one right)

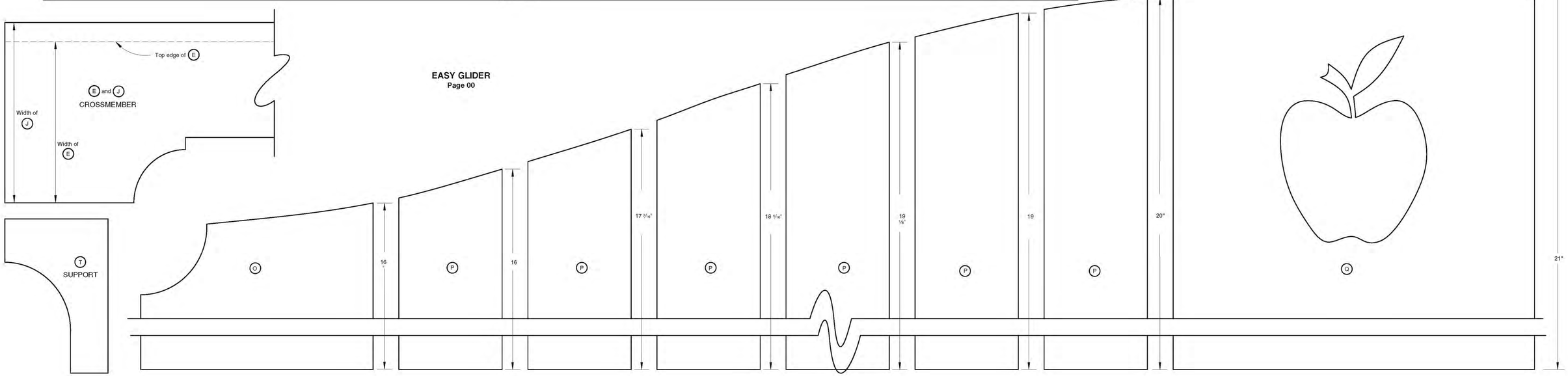
**PELVIC FIN**
END VIEW
CROSS-SECTION B-B




**PECTORAL FIN**
SIDE VIEW
(Make one left and one right)

**PECTORAL FIN**
END VIEW
CROSS-SECTION C-C




**EASY GLIDER**
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